An Evaluation of the Quality of Care of Diabetic Patients with Multimorbidity at Nurse Practitioner-Led Clinics in the North East and North Simcoe Muskoka LHINs

By

Roberta Heale

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Faculty of Graduate Studies
Laurentian University
Sudbury, Ontario, Canada

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Thesis Examiners/Examinateurs de thèse:

Dr. Susan James
(Supervisor/Directrice) de thèse)

Dr. Elizabeth Wenghofer
(Committee member/Membre du comité)

Dr. Marie-Luce Garceau
(Committee member/Membre du comité)

Dr. Tammy O'Rourke
(External Examiner/Examinateur externe)

Dr. Sara Burke
(Internal Examiner/Examinatrice interne)

Approved for the Faculty of Graduate Studies
Approuvé pour la Faculté des études supérieures
Dr. David Lesbarrères
Monsieur David Lesbarrères
Dean, Faculty of Graduate Studies
Doyen, Faculté des études supérieures

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Abstract

A multiple case study was undertaken with five Nurse Practitioner-Led Clinics (NPLCs) in in the North East and North Muskoka Simcoe Local Health Integration Networks in Ontario, Canada. The purpose was to evaluate the quality of care in NPLCs, specifically to address the following research questions: What is the relationship between organizational processes in the NPLC model and the care of diabetic patients with multimorbidity? To what extent are clinical practice guideline indicators for diabetes care being met for patients with multimorbidity in five NPLCs? How do nurse practitioners practicing at NPLCs evaluate the impact of the NPLC model on the quality of the care they provide to diabetic patients with multimorbidity? The research was guided by the Donabedian Quality Framework.

The study included three types of data collection. First, documents related to NPLCs were collected and the impact of the nurse practitioner (NP) as primary care provider was analyzed. Then the Chronic Care Model was used to guide the development of a chart audit in each of the five NPLCs, conducted on 30 charts per clinic (n= 150) for non-pregnant, adult diabetic patients with multimorbidity. Analysis determined relationships between diabetes indicator scores and organizational and patient data. Next, 8 NPs from 4 of the 5 NPLCs participated in interviews, guided by semi-structured questions arising from the document review and chart audit analysis. Interpretive description methods were used to analyze the transcripts and identify themes.

A cross-case analysis was conducted to compare the results of all analyses across NPLCs. Themes emerging from this multiple case analysis confirmed that the NP is the primary care provider and clinical leader at NPLCs, which has contributed positively to the quality of care in NPLCs. NPLCs have suffered from poor NP recruitment and retention. This, along with insufficient health care resources in the communities where NPLCs are located and high patient vulnerability, has had a negative influence on the quality of care. Strategies including mentoring and changes to funding offer possible solutions to improve the quality of care at NPLCs. (336 words)

Keywords: nurse practitioner-led clinic, nurse practitioner, multimorbidity, quality of care, multiple case study

Co-Authorship Statement

The three papers included in this thesis document were co-authored by Roberta Heale, PhD candidate, Susan James, PhD supervisor, and committee members Elizabeth Wenghofer and Marie-Luce Garceau. A draft of each paper was completed by Roberta Heale with comments and edits provided by the co-authors.

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Chapter 1

Personal Reflection

My background and practice as a NP have informed this study. As such, personal reflections about my experiences will assist in understanding my rationale for completing this PhD.

I became an NP in 1999 in Ontario, Canada, during a time of tremendous change within the health care system. The old model of the family doctor was not working anymore and millions of people in the province did not have access to one. NPs were seen as one solution to this problem, but were faced with a great deal of turmoil in the implementation of this expanded nursing role. My colleagues and I struggled to meet the needs of our patients within the restrictions of the health policy and regulatory environment of the day. One success during this time was the NPLC model.

In 2006, my colleague and I were granted the opportunity to establish Canada's first NPLC. This came after years of practicing as NPs in downtown Sudbury, Ontario, and seeing firsthand the large numbers of people without access to comprehensive primary health care (PHC). In the clinic where I first practiced as an NP, Victorian Order of Nurses Sudbury Branch (VON), I took on as many of the patients as I was able, on a first-come, first-serve basis. I soon discovered that it was the vulnerable populations, those that fell most easily through the cracks, who did not have access to care. My practice very quickly included a significant number of patients from the addiction recovery continuum, families whose children were supervised by the Children's Aid Society, elderly patients with multiple chronic diseases who were let go by their family doctors during downsizing, and more. Not only did I serve a largely vulnerable population, with complex

health issues, this was a time in Ontario when the scope of practice of NPs was very restricted and we were obliged to rely a great deal on physician collaboration for a large percentage of care that we are now able to provide independently (College of Nurses of Ontario [CNO], 2008).

I also quickly discovered that physician practices were not accepting patients in the order that they signed up to register. Many physicians had an application and interview process that allowed them to choose specific cohorts of patients, most of whom were not categorized as vulnerable (Butcher, 2015). It also became apparent that there was wide variation in the resources available to the various PHC practices. For example, during this time when NP positions were awarded to organizations, funding included the NP salary, a small amount for benefits and another small amount of funding directed to supplies. There was no funding for clerical support, rent, or remuneration for physician collaboration (Butcher, 2015). Thus, NPs working in many organizations did not have the advantages of some PHC models, such as family health teams (FHTs), community health centres (CHCs), or Aboriginal health access centres. These organizations are awarded a budget with lines for salary and benefits for physicians, NPs, registered nurses (RNs), social workers, dieticians, community workers and more, as well as funding for space, administration costs, equipment and supplies. In addition, and this is still the case today, NPs did not have the means for garnering any additional funding to make up the shortfall in the ministry-funded positions, like physicians who were still able to bill fee-for-service in blended salary models and are able to earn bonuses through specific care provided to patients.

NPs working in organizations, such as VON Sudbury, often had to accept a salary lower than what was granted to the organization by the Ministry of Health and Long-Term Care (MOHLTC) so that the extra funds could offset the cost of such things as clerical support and physician

collaboration costs. Even with this questionable practice, NPs often had to perform administration or clerical work (Koren, Mian & Rukholm, 2010). I started my practice, as a novice NP, with 3 hours of physician support every two weeks. I was often left without any clerical support which forced me to answer the phone, make appointments for patients, file reports, manage the waiting room and more, all while providing care to patients.

VON Sudbury went bankrupt in June 2004. It was independently incorporated but was part of VON Canada. A few programs, such as the NP Clinic, were funded directly from the MOHLTC, so they continued to run through VON Canada, Ontario Division. VON Sudbury had been participating in bingo games to raise money for physician collaboration. With almost all other programs removed from VON Sudbury, the small number of people left in the organization were expected to work at the bingo games, me included (Butcher, 2015). It certainly was not ideal, cost effective, or professional for NPs to work at bingo games to raise money for their clinics.

Despite reduced resources and vulnerable populations served, NPs like me developed family practices that provided comprehensive PHC services. We knew that to be truly effective we needed a funding model that encompassed all aspects of clinic operations, so my colleagues and I jumped when opportunities to apply for comprehensive clinic services arose. Among many other request for proposals (RFPs) for a variety of opportunities, including FHTs, Marilyn Butcher and I applied for an NP-Led FHT in 2005. Given that this was not a physician-led proposal, it was not surprising that our proposal was initially rejected. However, the timing was right to lobby for an NP-led clinic model. With the support of a number of key stakeholders and in a community with 8 unemployed NPs and an estimated 30,000 unattached patients, we were given the opportunity to establish the first NPLC in Sudbury in 2007 (Heale and Butcher, 2010).

The announcement for the first NPLC was made at the annual Nurse Practitioners' Association of Ontario conference in Hamilton in November 2006. Before arriving back home, Marilyn Butcher had received a call on her home phone from the Ontario Medical Association (OMA) requesting more information about the clinic model (Butcher, 2015). From this point, the backlash from physician organizations was immediate and continued. The OMA submitted a request through the Freedom of Information Act for a copy of the NPLC budget in the first year of operation with the intention of demonstrating that NPLCs were not cost effective. A very derogatory letter about the NPLCs from the then president of OMA to the Minister of Health was sent to us from a colleague. It included specific details about the clinic operations, numbers of patients and budget that could only have been obtained by someone close to the project, leading the Minister of Health to determine that someone in the ministry was leaking information. This occurred in parallel to negative letters sent to newspapers and other media.

Additional efforts to thwart the development of the NPLCs were undertaken. In 2007, the NP scope of practice remained very limited, with restrictive drug and lab lists, requiring us to rely on physician collaboration in order to provide comprehensive primary health care services (CNO, 2008). Although there was a physician salary model negotiated by the OMA in Ontario in the CHCs, our request for a physician salary line in the NPLC was denied. Rather we were told that we would have to recruit physicians who would then roster all the clinic patients to themselves. This would have completely devastated the concept of the NP as clinic leader. Thus, we settled for the collaboration funding of $800/NP/month for physicians and fee-for-service remuneration for direct patient care provided onsite by the physicians (Butcher, 2015).

The remuneration strategy was not ideal and impacted recruitment of physicians to the clinic, but it did allow the first NPLC to begin operations. Unfortunately, at least one physician in the early

years of the first NPLC, left under pressure from his physician colleagues (Butcher, 2015). Thankfully, we had developed strong relationships with previous collaborative physicians who we were able to recruit.

Our response to negative feedback to the development of the NPLC was to develop a positive message campaign for the public to highlight the successes of the clinic (Butcher, 2015). We also acted strategically to ensure full support to the additional 25 NPLCs that were awarded and under development across the province. For example, we used all legal authority to extend the request by the Ontario Medical Association for our budget as long as possible. By 2013, the third wave of applications for the NPLCs was over and by 2015 the other NPLCs were operational (Nurse Practitioners' Association of Ontario [NPAO], n.d.b.)

Since 2007, NP scope of practice has changed substantially, including the removal of the drug and lab list and move to being able to prescribe almost any medication (Legislative Assembly of Ontario, 2009). This, along with other expansions to the NP scope of practice, relaxed the need for physician collaboration for routine care and the collaborative physicians have become primary care consultants at NPLCs who provide guidance for the most complex cases.

Being part of the evolution of the NPLC model, as well as a professor in the NP education program in Ontario and involved in NP organizations have all given me insight into its unique features, including the benefits, such as increasing access to comprehensive primary health care. I am also more aware of the potential barriers to operation. For example, the initial response from physician groups and from some factions of the MOHLTC leads to questions about the equity for the NPLC model within the health care system. Also, my interaction with staff at various NPLCs prompted me to consider the level of preparation and readiness of NPs in taking

on full leadership roles within the NPLCs. Data has the potential to inform improvements and to support operations within the NPLCs. However, there is a dearth of evidence related to the NPLC model.

My understanding of the importance of the NPLCs in the communities where they have been developed, the obstacles faced in setting up these operations and the lack of evidence to support the model led me to this PhD. Knowing how close I am to the issue, I chose to conduct research related to the NPLC model through an academic program. My committee has assisted me in acknowledging and sifting through my biases to ensure that the final product is as true a reflection of the NPLCs as possible.

I chose one small piece of the evaluation of quality of care within the NPLC model by conducting a multiple case study, with 5 NPLCs. Although evidence related to all NPLCs is not available, this research has led to insights not only about the NPLC model, but also about NPs themselves and how we are viewed in the Ontario health care landscape.

Chapter 2

Introduction

A strong PHC sector is important in ensuring positive individual and population health outcomes (Working Group on Primary Care, 2011). Many issues impact the quality of PHC such as the extent to which a patient has access to a PHC organization, as well as timely access to a health care provider (Working Group on Primary Care, 2011). PHC organizational factors influence the quality of care that patients receive (Russell, Dahourge, Hogg, Geneau, Muldoon & Tuna, 2009; Russell, Dahrouge, Tuna, Hogg, Geneau & Gebremichael, 2010). Additionally, multimorbidity, which is prevalent in a large percentage of patients in PHC settings, further adds to the complexity of care and impacts the quality of care delivered (Fortin, Lapointe, Hudon & Vanasse, 2005; Fortin, 2005).

Accessible and comprehensive PHC services are known to help prevent morbidity and death (Starfield, Shi & Macinko, 2005). Studies demonstrate that the model in which PHC is delivered has an impact on patient outcomes (Glazier, Zagorski & Rayner, 2012; Glazier, Hutchison & Kopp, 2015; Hogg et al., 2009; Liddy, Weins & Hogg, 2011; Russell, Dahourge, Hogg, Geneau, Muldoon & Tuna, 2009; Russell, Dahrouge, Tuna, Hogg, Geneau & Gebremichael, 2010), including those of patients with multimorbidity (Margengoni et al., 2011).

NPLCs are a new model of family practice PHC in Ontario. Patients register at the NPLC where they receive comprehensive care. In the NPLC design, patients at the NPLCs are assigned to a NP, a type of advanced practice nurse, who provides all care within her scope of practice. The NPs collaborate with an interprofessional team including physicians, RNs, dieticians, social workers

and pharmacists, as necessary (Virani, 2012). NPLCs were established in order to increase accessibility to comprehensive PHC services (MOHLTC, 2015a). There have been several studies evaluating the quality of care in PHC models in Ontario (Dahrouge, Hogg, Russell, Geneau, Kristjansson, Muldoon & Johnston, 2009; Glazier, Zagorski, & Rayner, 2012; Glazier, Hutchison, & Kopp, 2015), however, there has been no research determining the quality of care provided in NPLC model.

A multiple case study of five NPLCs is presented in this document. The focus of the research was of the care quality patients with diabetes and multimorbidity received while registered in NPLCs. This research is an important first step in addressing how well these organizations function in meeting the needs of their most complex patients. A multiple case study approach was valuable in addressing the gap in what is known about the NPLC model. The design promotes the understanding of complex phenomenon through analysis of the features of several cases that are not uniform, but that are linked by common characteristics (Stake, 2006).

This study adds dimension and awareness of the functioning of the NPLC model and highlights what is unique about the NPLC model in the delivery of care for patients with diabetes and multimorbidity. Increasing an understanding of the benefits, pressures and deficits in the NPLC model has the potential to assist with decisions of the NPLC teams, as well as policy makers, in realignment of care for optimal health outcomes.

NPLCs are organizational entities with NP leadership, arising from a grass-roots lobby that was ultimately legitimized through a health policy initiative within Ontario's health care system. The unique features of the provincial health care system, including primary health care, NP practice

and Northeastern Ontario geography, have all had an influence on the development and implementation of NPLCs.

Research related to health policy and health systems is very complex. It is important to contextualize all pertinent elements within the environment to develop a foundation for the research (Walt, Shiffman, Schneider, Murray, Brugha & Gibson, 2008). To this end, Chapter 3, the literature review, is focused on providing background into the purpose and significance of the research. Specifically, this includes describing and defining advanced practice nursing with a focus on NPs in Ontario, an overview of primary health care in Ontario, all of which provides a context for the development of the NPLC model. Next is a description of the development of NPLCs and, finally, a review of research related to quality in primary health care models in this province.

Chapter 4 includes a review of the theoretical frameworks and the clinical practice guideline chosen to guide this study. The next chapter outlines this study and includes a discussion of the Multiple Case Study design and Donabedian's Quality Framework. The setting for the study and variables were examined. This includes multimorbidity, use of clinical practice guidelines in primary health care practice and organizational processes.

Chapter 5 is an article about the analysis arising from NP interviews, specific to their perceptions of the quality of care of patients with diabetes and other chronic conditions within the NPLC model. Chapter 6 is an article which reflects the extent of the completeness of diabetes care for patients with multimorbidity in NPLCs. The following chapter, 7, is an article of a multiple case analysis arising from the evaluation of 5 NPLCs. Chapter 8 includes discussion about the overall

findings, a critique of the Donabedian Framework and reflection on the historical impact of nursing on the NP role and NPLCs.

The first two articles, NP perceptions and chart audits, provide insight about the processes within the NPLCs which influence the quality of care of patients with diabetes and multimorbidity. The final article provides an analysis of the data from all sources, including documents collected between 2012 and 2017.

Chapter 3

3 Literature Review

3.1 Advanced Practice Nurse

NPs belong to a classification of nursing that is categorized in the umbrella term 'advanced practice nurses' (Canadian Nurses Association [CNA], 2008). Since NPs are compulsory health care providers in the NPLC model of care, understanding the role of an advanced practice nurse, the development of the NP role in Ontario as well as the barriers and facilitators to NP practice, is an essential foundation to comprehension of the development and implementation of care in the NPLC model.

An advanced practice nurse is an umbrella term, identifying RNs who work at a higher level than that of the registered nurse (Sheer & Wong, 2008). The first NP roles were developed in the United States in the mid-1960s when groups of RNs were given authorization to perform some medical tasks (Duffield, Gardner, Chang & Catling-Paull, 2009). Since then, advanced practice nursing roles have evolved in various forms and with various designations across the globe (Duffield et al., 2009; Maier, Aiken & Busse, 2017). Designations include NP, clinical nurse specialist, nurse specialist, advanced practice nurse and nurse midwife to name a few (Pulcini et al., 2010; Heale & Rieck-Buckley, 2015).

Each country and jurisdiction has operationalized advanced practice nursing roles separately and uniquely. The wide range of titles, educational and credentialing requirements and scopes of practice (Bryant-Lukosius, DiCenso, Browne & Pinelli, 2004; Heale & Rieck-Buckley, 2015; Maier, Aiken & Busse, 2017) have resulted in variation and confusion about advanced practice

nursing roles (Bryant-Lukosius et al., 2004: Maier, Aiken & Busse, 2017). The unique political climate and health care policies of each jurisdiction has resulted in a lack of standardization of advanced practice nursing roles globally and comparison of practices is daunting.

3.1.1 Conceptualization of Advanced Practice Nursing

APN roles are more than the authorized clinical tasks and/or controlled acts associated with them. Articulating and understanding the role of advanced practice nurses is difficult for a number of reasons. These roles are extensions of those of registered nurses (RNs) and the scope of practice of advanced practice nurses typically overlaps that of RNs and physicians. The expectations for advanced practice nurses often reach beyond direct clinical practice and may include such things as leadership and research toward health policy and system change. Policy and/or regulation may not provide a clear understanding of the actual practice of the APN role (Spross & Lawson, 2009).

A strategy to help overcome confusion related to APN roles was the development of conceptual frameworks, or models of advanced practice nursing. The purpose of the models is to describe the nature of APN roles, what is common among them, whether an overarching description can be achieved and what differentiates APN roles from other nursing roles (Spross, 2014). Consensus of APNs for a conceptual model that explains practice may assist in the development of educational programs and lobbying for health policy changes and employment opportunities. Several APN frameworks have been developed in the past forty years and each one strives to identify and explain the relationship between key elements of APN practice (Spross, 2014).

The APN conceptual models emphasize different aspects of the APN role. However, most include common elements including criteria for becoming an APN (e.g. educational

requirements); competencies such as direct patient care, but also broader competencies like evidence-based practice, collaboration, consultation and leadership. Finally, environmental aspects such as health care policy, regulatory requirements and organizational structure and culture are often integrated into APN conceptual model (Spross, 2014). APN models serve as a guide to the understanding of the criteria related to an APN role, their position within the health care system and the nature of APN practice.

3.1.2 APNs Internationally

There are many drivers for the development of advanced practice nursing roles such as the need for improved access to care as a result of physician shortages and to address unmet or targeted health needs of a population (Furlong & Smith, 2005; Sibbald, Laurent & Reeves, 2006; Delamaire & Lafortune, 2010). Advanced practice nursing roles have also developed as a cost containment measure to counter rising physician remuneration costs in health care systems and from the belief that the added quality of care that advanced practice nurses provide will result in an overall reduction of health care system costs (Bryant-Lukosius et al., 2004; Delamaire & Lafortune, 2010; Furlong & Smith, 2005; Maier, Aiken & Busse, 2017).

3.1.2.1 APN Scope of Practice

The scope of practice of advanced practice nurses varies widely across the globe and even between advanced practice nurses within the same jurisdiction. Additional authorization for advanced practice nurses typically includes such things as communicating a diagnosis, prescribing medication, ordering diagnostic testing, admitting to hospital, performing controlled medical acts such as intubation and practicing independently, or autonomously (Delamaire & Lafortune, 2010; Maier, Aiken & Busse, 2017). In part, the variation in the scope of practice of

advanced practice nursing roles across jurisdictions is a reflection of the tasks they are authorized to perform beyond that of the RN.

3.1.2.2 APN Regulation

Nursing practice is regulated in some, but not all, countries and advanced practice nursing regulation is even less likely to occur when no nursing roles are regulated in a jurisdiction (Morrison & Benton, 2010). If it exists, regulation may be restrictive, or permissive in the approach to authorization of tasks and duties of the advanced practice nurse. For example, each state in the US has specific regulation for NP practice which tends to be restrictive through such things as lists of medications that can be prescribed. Similar processes were implemented in Ontario where the original regulation for NPs, The Expanded Nursing Services for Patients Act, also included restrictive drug and lab lists (Legislative Assembly of Ontario, 1997). In contrast, in the UK, there is a more permissive approach where an advanced practice nurse can prescribe from the full medication consortium having completed a credentialing process with specific education (Ketefian, Redman, Hanucharurnkul, Masterson & Neves, 2001).

Some countries, such as the UK, do not have separate legislation for advanced practice nursing roles. Nurses are authorized to perform advanced skills through a credentialing process (Ketifian, et al., 2001). Even within a regulation or credentialing framework, advanced practice nurses may be authorized to perform only a limited number of tasks associated with advanced practice (Delamaire & Lafortune, 2010). Regulation may not include title protection. Without it anyone is able to use the title of NP, for example (Bryant-Lukosius et al., 2004).

3.1.2.3 APN Educational Criteria

Educational requirements are a key feature of regulation and/or credentialing frameworks for advanced practice nursing roles (Bryant, 2005). Typically, there are also processes for review of the quality of advanced practice nursing education, for ongoing assessment of APN competencies and for re-licensing of the advanced practice nurse (Bryant, 2005).

3.2 Barriers to APN Practice: International Perspective

Many barriers to the implementation of advanced practice nursing roles and practice have been identified (Delamaire & Lafortune, 2010; Heale & Rieck-Buckley, 2015; Ketefian et al., 2001Bryant-Lukosius et al., 2004). Although barriers are specific to location and political circumstances, there are some commonalities internationally including lack of effective nursing leadership, restrictive legislation, lack of evidence to support the development of APN roles and limited employer understanding of the APN roles. Opposition by physician groups and other health care providers has proven to be the most significant barrier in many countries (Delamaire & Lafortune, 2010; Heale & Rieck-Buckley, 2015; Ketefian et al., 2001).

Lack of effective nursing leadership in the development and implementation of advanced practice roles is another barrier (Delamaire & Lafortune, 2010; Heale & Rieck-Buckley, 2015; Maier, Aiken & Busse, 2017) as is lack of understanding of the potential of an advanced practice role with policy and decision makers (Villegas & Allen, 2012; Maier, Aiken & Busse, 2017). The number of advanced practice nurses is very small compared to the general nursing population of a country, reducing their potential influence (Delamaire & Lafortune, 2010). Restrictive legislation and regulation as well as the extent to which a specific society values the work of women continues to be an issue for enhancing nursing roles in many countries (Delamaire & Lafortune, 2010; Maier, Aiken & Busse, 2017; Villegas & Allen, 2012).

Although there is progress in the area of research about advanced practice roles and evidence to support their value, an additional barrier in the past to the implementation of these roles has been a lack of research about the effectiveness of APN care and patient outcomes (Pulcini & Hart, 2007; Maier, Aiken & Busse, 2017). Despite burgeoning research about advanced practice roles, comparisons remain difficult when the regulation, educational requirements and health system in which APNs are employed vary considerably (Brooten, Youngblut, Deosires, Singhala & Guido-Sanz, 2012). Organizations that hire APNs often have a limited understanding of the potential of an advanced practice nursing role and thus the APNs are often underutilized, are viewed simply as physician replacement, or experience role conflict and role overload (Bryant-Lukosius et al., 2004; Delamaire & Lafortune, 2010). There is strong opposition to advanced practice nursing roles where remuneration of an advanced practice nurse may impact physician remuneration, such as with fee-for-service models (Delamaire & Lafortune, 2010; Palumbo, Marth & Rambur, 2011; Maier, Aiken & Busse, 2017; Villega & Allen, 2012).

3.3 Nurse Practitioners in Ontario

One advanced practice nursing role in Canada is the NP (CNA, 2008). Better access to health care in rural and remote locations was a catalyst for the initiation of NP roles in Canada, including the NP role which originated in Ontario in the 1970s (Delamaire & Lafortune, 2010). University programs to support the emerging role of the NP were established, however, these programs were all closed by 1983 as a result of lack of funding for NP positions and lack of regulation for the role. Approximately 250 NPs continued to practice in Ontario in these early years and to advocate for renewed interest in the NP (NPAO, 2016a). The only province that currently has NPLCs is Ontario. As such, the discussion about NPs is focused in this province including establishment of

education programs, regulation (provincial and federal) and controlled acts authorized to NPs in Ontario.

3.3.1 NP Education

In 1994, the MOHLTC renewed funding for NP education in Ontario. The Council of Ontario University Programs in Nursing (COUPN) Primary Health care Nurse Practitioner (PHCNP) program was established. It is a PHCNP program with courses delivered originally across a consortium of ten universities, now nine. It is offered in both French and English and in a hybrid model with some coursework occurring online and some at the home university (Council of Ontario Programs in Nursing [COUPN], 2012). The College of Nurses of Ontario recognizes NP education from other programs, however, the COUPN NP program continues to be the most prominent PHCNP program in Ontario (Martin-Misener et al., 2010).

Originally, funding for the COUPN PHCNP program supported a post baccalaureate certificate. As the role of the NP expanded and grew in the province and across the country, and as the role of the NP became more established internationally, a graduate degree was recognized as ideal for NP entry to practice (Martin-Misener et al., 2010). Lobbying for funding to support a graduate degree for NP programs took place. Universities hosting NP educational programs, the Nurse Practitioners' Association of Ontario (NPAO), the Canadian Nurses Association (CNA) took part in lobbying, but it did not result in changes to funding for the NP program. However, each of the nine remaining universities in the COUPN PHCNP program have integrated the core NP program courses into existing graduate degrees at the respective universities (COUPN, 2012).

3.3.2 NP Regulation

RNs worked in advanced roles, calling themselves NPs, since the 1970's in Ontario (NPAO, 2016) prior to the legitimization of the role through regulation. Following the re-establishment of NP education, with the development of the COUPN NP program in Ontario in 1995, the Expanded Nursing Services for Patients Act authorizing NP practice, was fully passed in 1998 including removal of many regulatory barriers and achievement of title protection (Legislative Assembly of Ontario, 2009). Ideally, policy and documentation related to the competencies of an advanced practice nursing role should be developed prior to educational programs, however, this was not the case in Ontario (Bryant, 2005; NPAO, 2016a).

3.3.2.1 Federal Regulation and Impact on Ontario NPs

Regulation for health care providers in Canada is the responsibility of provinces. However, some federal legislation impacts the practice of health care providers. If it is amended, there must be parallel changes to corresponding provincial legislation in order for it to impact the practice of health care providers. An example of this is the Controlled Drugs and Substances Act, which is federal legislation related to the acquirement, storage, disposal, administration and prescribing of medications such as narcotics (Canada, 2017). Although NPs in Ontario have had prescriptive authority since 1997 (Legislative Assembly of Ontario, 1997), federal legislation did not grant NPs the authority to prescribe controlled substances until 2012 (Canada, 2017). Regardless of changes to the federal act, NPs in Ontario were not permitted to prescribe controlled substances until changes to the *Nursing Act*, 1991 in March 2017 (Ontario, 2017).

3.3.2.2 Provincial Regulation of Health Care Providers

In most other areas, the government of Ontario makes decisions about which health care providers are regulated and legislates the scope of practice of each. This is the case for NPs in

Ontario, who are regulated by the *Nursing Act*, 1991, the *Regulated Health Professions Act* (RHPA) and governed by the College of Nurses of Ontario (Ontario, 1991a, 1991b; CNO, 2016b).

In Ontario the RHPA (Ontario, 1991b) includes a scope of practice statement and a series of authorized, or controlled acts for each regulated health care provider group. In Ontario, there are 13 controlled acts, which include the following:

1. Communicating to the individual or his/her personal representative, a diagnosis identifying a disease, or disorder, as the cause of symptoms of the individual in circumstances in which it is reasonably foreseeable that the individual or his/her personal representative will rely on the diagnosis.
2. Performing a procedure on tissue below the dermis, below the surface of a mucous membrane, in or below the surface of the cornea, or in or below the surfaces of the teeth, including the scaling of teeth.
3. Setting or casting a fracture of a bone or dislocation of a joint.
4. Moving the joints of the spine beyond the individual's usual physiological range of motion, using a fast, low amplitude thrust.
5. Administering a substance by injection or inhalation.
6. Putting an instrument, hand or finger.
    i. beyond the external ear canal,
    ii. beyond the point in the nasal passages where they normally narrow,
    iii. beyond the larynx,
    iv. beyond the opening of the urethra,
    v. beyond the labia majora,

vi. beyond the anal verge, or

vii. into an artificial opening into the body.

7. Applying or ordering the application of a form of energy prescribed by the regulations under this Act.
8. Prescribing, dispensing, selling or compounding a drug as defined in the *Drug and Pharmacies Regulation Act* or supervising the part of a pharmacy where such drugs are kept.
9. Prescribing or dispensing, for vision or eye problems, subnormal vision devices, contact lenses or eyeglasses other than simple magnifiers.
10. Prescribing a hearing aid for a hearing-impaired person.
11. Fitting or dispensing a dental prosthesis, orthodontic or periodontal appliance or a device used inside the mouth to protect teeth from abnormal functioning.
12. Managing a labour or conducting the delivery of a baby.
13. Allergy challenge testing of a kind in which a positive result of the test is a significant allergic response. (Ontario, 1991b; CNO, 2017a)

Through regulation, health care providers may be authorized to perform all or part of a controlled act. For example, although RNs are fully authorized to conduct # 5 and 6 from the list above, they are authorized only part of #2 and #8, specifically to perform a prescribed procedure below the dermis or a mucous membrane and dispense a drug (Ontario, 1991b; CNO, 2017a).

3.3.2.3 Provincial Regulation of NPs

In 1997, NPs were regulated and granted the authority to perform an additional three controlled acts beyond that of the registered nurse with restrictions. These were #8 prescribing of

medications from a list, #1 communicating a diagnosing with restrictions and #7 ordering a form of energy (e.g., ultrasound) from a list (Ontario, 1991a).

The initial lists and criteria for consultation with a physician were very restrictive and created many barriers to NP practice (Health Professions Regulatory Advisory Council, 2008). In addition, the regulation in other sectors of government, not within the MOHLTC and not aligned with the *Expanded Nursing Services for Patients Act* (1997), created additional barriers for NP practice. An example is the authority for an NP to complete the Ministry of Transportation driver's physical assessment form, used, for instance, for people employed as school bus drivers. Although the physical assessment requirements on the form were well within the scope of practice of the NP, the MTO did not immediately recognize NPs until after several years of advocacy work. Additionally, at this time, NPs are still unable to complete the Fitness to Drive assessments from the MTO (NPAO, n.d.a).

Strong, continuous lobbying on behalf of NPs and the NPAO enabled expansion of the drug and lab lists over time, but the ultimate objective was removal of the lists altogether to achieve 'open prescribing'. In 2007, the Minister of Health and Long-Term Care, George Smitherman, charged the Health Professions Regulatory Advisory Council (HPRAC) to conduct a review of NP scope of practice and provide recommendations (HPRAC, 2008). After an extensive review, rather than removal of the restrictive lists, the HPRAC committee recommended a change to the process for review of the lists for prescribing and diagnostic testing (HPRAC, 2008). Despite this, the efforts of NPs and NPAO to highlight the barriers to practice to the government of Ontario paid off and the drug lists and list of laboratory tests were removed in the passing of Bill 179, *Regulated Health Professions Statute Law Amendment Act* (Legislative Assembly of Ontario, 2009)

Although Bill 179 was passed in 2009, by November 2017 not all changes in the Bill had been enacted. NPs now have 'open prescribing' and are able to order blood work without restrictions, but NPs are still only able to order diagnostic tests from a restrictive list. Even though federal restrictions to NP prescribing of controlled substances, such as benzodiazepines and opioids, have been removed, it took five years for legislation provincially to be edited to allow NPs to begin prescribing these substances (CNO, 2017b; Legislative Assembly of Ontario, 2009).

Along with the expansion to medications and testing that NPs were able to do, the amendments to the RHPA acknowledged additional NP specialties (Legislative Assembly of Ontario, 2009). The NP roles now include the Primary Health care NP role, the Adult NP, often described as the acute care NP, and the Pediatric NP. The changes to the RHPA removed restrictions to controlled acts, which previously included such things as prescribing a specific medication only 'in case of emergency'. The changes also removed the restrictions to the drug, lab lists and diagnosing and gave NPs the authority for additional controlled acts including applying a cast and prescribing, dispensing, selling or compounding a drug in accordance with the regulation (Ontario, 1991b; CNO, 2017a).

3.3.2.4 NP Scope of Practice

The *RHPA*, 1991, and *Nursing Act*, 1991, are the legislative framework for NP scope of practice (Ontario, 1991a, 1991b). Although regulation is a foundation for scope of practice, it does not specifically define the NP practice arising from it. The College of Nurses of Ontario issues Practice Standards for NPs, which outline the competencies that NPs must have in order to perform the authorized controlled acts (CNO, 2017b). The Practice Standards also identify that NPs have expertise that is not regulated or reflected in legislation. For example, NPs may have knowledge and skill in health promotion, rehabilitative and palliative care, to name a few (CNO,

2017b). Given this, the concept of the scope of practice is broader than individual controlled acts and includes the ability to work to the full extent of their education and training (Donelan, DesRoches, Dittus & Buerhaus, 2013). Scope of practice has been further defined as "a set of rules, regulations, and boundaries within which a fully qualified NP may practice" (Kleinpell, Hudspeth, Scodo & Magdic, 2012, p. 12). These boundaries are reflected in NP entry to practice competencies (CNA, 2010) and in the CNO (2017a) Practice Standards for Nurse Practitioners, which state that NPs are accountable to working within legal 'scope of practice' as well as their level of knowledge, skill and judgment.

Discussion in the literature about NP scope of practice and barriers to NPs working to their full scope of practice does not consistently refer to restrictions in the NP performing individual controlled acts. Rather, most barriers to practice refer to limitations to the NP working to the full extent of their knowledge, skill and judgment. For example, Donelan et al. (2013) describe a study where NPs surveyed indicated that they were not working to their full potential. Restrictions were related to the inability to provide full PHC services to patients and to be the primary care provider for patients.

An example is in a recent study that analyzed NP service codes in FHTs. The data showed that NPs saw patients consistently (greater than 70% of the visits in a year) for only 3.9% of patients. The remainder of the patients were seen by physicians. This implies that NPs are performing gap care, rather than taking a primary care role. Gap care, although essential, does not allow the NP to develop a strong therapeutic relationship with the patient, and to evaluate and monitor the patient's progress through over time. So, although these NPs are able to perform authorized controlled acts, they aren't likely practicing at their full potential (Heale, Dahrouge, Johnston & Tranmer, 2018).

3.3.3 Employment

Although NP education programs had been re-established and the role had been legislated, there were no employment opportunities for NPs in the late 1990's. During this time, some family physicians had hoped to hire NPs into their family practices, however, almost immediately following legislation for the NP role, the Ontario Health Insurance Plan (OHIP) published a bulletin indicating that physicians were not able to bill OHIP for services completed by NPs (Ontario, 1999). With no mechanism for remuneration, physicians were unable to hire NPs.

The MOHLTC issued Request for Proposals for NP positions and funding was awarded to agencies, municipalities and individuals across the province (DiCenso & Matthews, 2005). Problems arose immediately. Some NP positions had been awarded to agencies in communities where there were no NPs and, without funding for recruitment, many of the NP positions remained unfilled for years (Blythe & Baumann, 2006). Other agencies or municipalities awarded NP positions had no knowledge of the NP role and, subsequently, developed role descriptions which did not allow the NP to work to the full scope of the NP's knowledge, training and experience (DiCenso, Bryant-Lukosius, Bourgeault & Treloar, 2010). The result was that most NPs worked with targeted populations such as adolescents or older adults, or with targeted diseases such as diabetes or chronic obstructive pulmonary disease, rather than in the full scope of practice (DiCenso & Matthews, 2005). The full potential of NPs to increase access to comprehensive PHC had not being realized.

There have been hurdles to the full integration of NPs into PHC organizations, which have impacted NP practice. Poor understanding of the NP role along with lack of mentorship for newly graduated NPs, a lack of orientation to new positions and interprofessional conflict are some of the ongoing challenges faced by NPs (DiCenso et al., 2010b; Sullivan-Bentz et al.,

2010). In the initial legislation for NP practice, until the changes in 2011, NPs were required to collaborate with physicians in very specific circumstances. Many NPs faced conflict with physicians who did not understand their role and did not trust the care that they provided (Bailey & Jones, 2006). In the early 2000s, physician groups raised concerns about their liability working with NPs, which was successfully addressed by the NPAO (DiCenso et al., 2010b). More recently, NPs in PHC agencies did not have an increase in their salaries for ten years spanning from 2006–2016 (Tetley, Heydon & Agnew, 2016), resulting in serious recruitment and retention issues in the province.

Despite regulatory, educational and organizational barriers to practice, during the decade following NP legislation, NPs became established in all areas of health care in the province. Although the majority of PHC NPs work in community family practice settings, there are positions in hospitals, long term care, on palliative care teams and in focused clinics such as diabetes care (CNO, 2016a; DiCenso et al., 2010a; Koren, Mian, & Rukholm, 2010).

3.4 Primary Care and PHC

The terms primary care and PHC are concepts that are defined differently within and across nations and often used interchangeably (Muldoon, Hogg, & Levitt, 2006). There is a growing need to develop consensus for definitions and a common understanding of each concept. In Canada, the term primary care is most often used to describe 'family practice' care, where a health care provider has accountability for patients in a practice (Muldoon et al., 2006). The term PHC, arising from the World Health Organization (WHO) definition, has a much broader context. PHC denotes a health system which includes not only patient care in a community context but also public health approach (Muldoon et al., 2006).

PHC was first globally acknowledged and defined in the Declaration of Alma-Ata in 1978 and was identified as the first level of contact of individuals, families and communities with the health care system in a country and the first element of a continuing health care process ("Declaration of Alma-Ata", 1978). The conditions for a strong primary health care system were outlined in the Alma-Ata, in particular, PHC in a local context relies on properly trained and appropriately utilized health human resources ("Declaration of Alma-Ata", 1978).

There are benefits to a strong PHC system. These include more coordinated care, better quality of care and a better use of health care resources (Muldoon et al., 2006; Romanow, 2002). There are also numerous benefits to appropriate primary care within a PHC system. When primary care is available, there are better population health profiles and lowered overall costs to a health care system (Starfield, Shi & Macinko, 2005; Macinko, Starfield & Shi, 2003).

3.4.1 Primary Health Care in Ontario

The delivery of health care in all jurisdictions of Canada is dependent on the nature of funding. Health care in Canada has a national health insurance program, known as Medicare, that includes thirteen different insurance plans, one for each province and territory. The plan ensures that Canadian residents have reasonable access to hospital and physician services (Health Canada, 2010). The *Canada Health Act* (1984) serves as a framework for health care in the country (Canada, 2012). Provinces receive some funding for health care from the federal government based on conditions outlined in the Act. Federal and provincial governments have a shared responsibility for health care. However, provinces and territories are responsible for the management, organization and delivery of health care services in their respective jurisdictions, including the organization of primary care services (Health Canada, 2010).

Primary health care in Ontario is delivered in family practices and clinics, long term care, hospital outpatient care, walk in clinics and more (Deber et al., 2006). Primary care in the PHC sector is typically focused in physician family practices and primary health care organizations such as CHCs, FHTs, Aboriginal health access centres, nursing stations and NPLCs. Health care funding has shaped the models of primary health care and the providers working in primary care (Deber et al., 2006).

Physician-led models of primary health care have dominated the landscape in Ontario, in particular, the traditional fee-for-service, solo family physician practice (Ontario, 2012). In the past decades, the majority of family doctors worked in physician-run solo practices. This has changed since the implementation of PHC reforms. Physician remuneration is now predominantly through patient enrolment models and alternate payment plans (Office of the Auditor General of Ontario, 2016). However, each model includes a significant fee-for-service component (Office of the Auditor General, 2016).

The OMA negotiates directly with the MOHLTC for physician remuneration, regardless of the setting in which the physician works (Ontario, 2012). Other health care providers and organizations are funded through programs developed in branches of the Ministry of Health, such as the Primary Care Branch, or, more recently, through a Local Health Integration Network (LHIN) (MOHLTC, 2013). From a systems perspective, the outcome of physician funding, be it fee-for-service, capitation or blended models, has been that most physicians in Ontario work as entrepreneurs in private practice (Office of the Auditor General, 2016).

3.4.2 Primary Health Care Reform in Ontario

There have been several waves of primary care reform in Ontario, most recently since 2000 (Sweetman & Buckley, 2014). The focus of these reforms was to move physician funding from a predominantly fee-for-service approach to a capitation and group practices. The objectives of the reforms were to stabilize family physician supply in Ontario, increase access to family physicians and address specialized population-based needs (Fitzpatrick, 2010). The MOHLTC rolled out contractual obligations for physicians in family practice including blended models of remuneration and such things as obligatory after-hours care. A rostering system was introduced whereby patients are linked to specific physicians along with corresponding incentive packages related to specific care provision given to their panel of patients (Fitzpatrick, 2010).

Provincial reforms in the early 2000s prompted the evolution of additional grouped physician practices in primary health care. Family health groups were developed in 2003 and are comprised of an agreement between three or more physicians to provide comprehensive primary health care services to their rostered patients along with afterhours care. Family Health Organizations followed in 2006 which includes groups of physicians paid predominantly by capitation but eligible for bonuses and premiums based on patient enrollment (Fitzpatrick, 2010).

Interprofessional, team-based care, has been one of the goals of these reforms, however, it was through the development of the Family Health Team in 2005 that the funding toward a group of physicians would also include salaries for other, independent health care providers such as NPs, RNs, social workers, dieticians and pharmacists (Ontario Health Quality Council, 2010).

3.4.3 Interprofessional Care Teams

An interprofessional care team "…is a group of professionals from different disciplines who communicate and work together in a formal arrangement to care for a patient population in a primary care setting" (Conference Board of Canada, 2012a, p. 2). There is potential for interprofessional care teams to improve health outcomes and reduce health care costs, particularly for chronic diseases, however, there are system support barriers in Ontario which impede their effectiveness (Conference Board, 2012a; Interprofessional Care Steering Committee, 2007).

Interprofessional care teams in primary health care in Ontario consist of physician-led (FHTs), nurse practitioner-led (NPLCs) and community-led (i.e., CHCs) models. Although there is a mix of providers on these interprofessional care teams, the teams most often consist of physicians, NPs with a mix of other disciplines (Conference Board, 2012a). The interprofessional care team members are salaried with the exception of physicians in FHTs, who are remunerated through some form of capitation, or blended salary models (Conference Board, 2012a). There is little research on the impact of physician remuneration and interprofessional care teams, however, there is speculation that alternate payment models (i.e., not fee-for-service) provide more incentive to physicians to participation on interprofessional care teams (Conference Board of Canada, 2012b).

Leadership within interprofessional care teams is well defined in physician-led practices where care is managed by a physician, or group of physicians who are have a responsibility for each patient (Conference Board, 2012a). Patients are identified to an individual physician through rostering (Fitzpatrick, 2010). Patients in NPLCs and CHCs do not roster to physicians or

individual providers at the clinics and it is not clear in the literature what the team leadership structure is or who is the responsible provider in these organizations (Conference Board, 2012a).

Barriers to interprofessional team functioning are numerous. Of major concern is a lack of role clarity and trust (Gotlib Conn, Oandasan, Creede, Jakubovicz & Wilson, 2010). Additionally, a perceived and projected hierarchy is a barrier to interprofessional care teamwork. Because of their expanded medical responsibilities, physicians have traditionally assumed leadership roles on interprofessional care teams (Gotlib Conn et al., 2010). These historical relationships are difficult to eliminate (Gotlib Conn et al., 2010), in particular there are deeply embedded historical relationships between physicians and nurses that influence interprofessional care teamwork (Conference Board, 2012b).

Organizational leadership and governance are also potential barriers to interprofessional care teamwork. The result of the rapid evolution in Ontario from predominantly fee-for-service family practices to complex interprofessional care teams has been that many teams and organizations are lacking the leadership and skills to develop and implement these changes effectively (Gotlib Conn et al., 2010). This includes the skill mix on both Board of Directors (as in CHCs and NPLCs) (Bateman, Bailey & McLellan, 2003) as well as the clinical leader and/or team (Howard, Shaw, Felsen & Crabtree, 2012).

Little is known about the effectiveness and impact of interprofessional teams in NPLCs, but there are many potential concerns. The NPLCs are predominantly grassroots organizations, without existing infrastructure when initially developed. The Board of Directors is established and staff hired, with potentially little or no experience. NPs may assume leadership roles in a manner outside of their previous training, knowledge, or experience.

3.4.4 Success of PHC Models

In the lessons learned about the implementation of new models of PHC, Susan Fitzpatrick, deputy minister of health in Ontario, indicated that there needs to be more emphasis on metrics, setting expectations and research related to the quality of care (Fitzpatrick, 2010). This was an important goal, in that the value in the investment of over $1 billion toward PHC reform (Fitzpatrick, 2010) from 2000-2010 was not easily measured. For example, the Ontario Health Quality Council (2010) report indicated that although 150 FHTs had been established in the five previous years, there had been no net increase in access to PHC services in Ontario. One thought is that FHTs to that date represented re-organizations of existing family practices, rather than new starts. In addition, the value-add of the interprofessional team in FHTs had yet to be seen and patients' accessibility to their family practice was questioned. A report in fall 2015 indicated that less than half of Ontario residents were able to see their primary care provider on the same day, or next day, if sick. This is the slowest rate of access in a comparison of ten other countries (Health Quality Ontario [HQO], 2015).

3.4.5 Evaluation of Quality of Care in Primary Health Care in Ontario

Clearly quality of care has become a focus. Patient access to a primary care provider as well as timely access to that provider are ongoing issues (HQO, 2015). The *Excellent Care for All Act* (Ontario, 2010) regulated processes that health care agencies must adhere to. One feature of this Act is that agencies must develop patient relation processes, such as policies for addressing patient complaints. In addition, health care organizations are required to develop and post annual Quality Improvement Plans that outline activities to achieve specific health targets. The Quality Improvement Plans were initially rolled out in hospital settings, but are now legally required to be completed by all primary health care organizations (MOHLTC, 2010; Ontario, 2010).

Building on an action plan established in 2012, The Patients First: Action Plan for Health (MOHLTC, 2015b) outlines the province's strategy to improve patient access to health care and to develop better coordination of care across sectors. It proposes that "Ontarians will have better and faster access to quality health services" (MOHLTC, 2015b, p. 4) through strategies designed to improve access, connect services, improve patient supports and protect the universal public health care system (Legislative Assembly of Ontario, 2016).

The next stage in the MOHLTC's plan for building effectiveness and efficiency in the health care system was announced in September 2015 with plans to move toward bundled care, or integrated funding models (MOHLTC, 2015a). In this funding model, a group of health care providers will be given a single payment to cover all the care needs of a patient's hospitalization and home care. The first wave of this funding was awarded to six programs. Results from simultaneous research will inform the direction and roll out of additional funding (MOHLTC, 2015a).

3.5 The First NPLC

During the early 2000s, as NP numbers grew and were working in all sectors of the health care system, NPs themselves began to notice issues arising from the existing NP practice and health care regulation. By 2007, there were close to 900 NPs in Ontario, working in all parts of the province and mostly in primary health care settings (Canadian Institute for Health Information, 2018). Even with restrictions on NP positions and barriers to practice, NPs were successfully developing family practice clinic settings, typically embedded within existing organizations, where the NP was the primary care provider with consultative physician support. The patients in these clinics tended to be those without access to family doctors, or were unattached, usually because of their complex medical, social and mental health needs (DiCenso et al., 2010a; Virani, 2012).

In the early 2000s in Sudbury, Ontario my colleague, Marilyn Butcher, and I noticed that there were large numbers of unattached patients. At the same time, there were eight unemployed or underemployed NPs who had the potential to increase access to primary health care for these people (Heale & Butcher, 2010). However, there are no mechanisms in the health care system for NPs to independently develop a practice, remunerated through public funds. Thus, we developed a proposal for an NP-Led Family Health Team was submitted to the MOHLTC in 2005. Given that FHTs are models of physician remuneration, it is not surprising that the proposal was rejected.

At this point, we approached the MOHLTC to reconsider the establishment of the NP-led clinic. After a period of intense lobbying, George Smitherman, then the minister of health in Ontario, agreed to the development of the first NPLC (Heale & Butcher, 2010). This was the first time in Ontario that health care providers, other than physicians, were able to develop a primary health care organization offering comprehensive family practice care. The Sudbury District Nurse Practitioner Clinics opened in August 2007. Based on the successful establishment of the first NPLC, Premier McGuinty announced the development of an additional 25 more in April 2008 (Heale & Butcher, 2010).

The first NPLC and the NPLC model underwent intense scrutiny and outright opposition by established medical associations such as the OMA and College of Family Physicians of Canada. In particular, there was backlash specific to the formal introduction in health policy of NPs as primary care providers and interprofessional team leaders. For example, some physicians in the Sudbury area promoted an alternative to the NPLC model whereby the physician remained the primary care provider and NP positions were added to their practices so that they could take on more patients (Mulligan, 2009). The OMA attempted to discredit the NPLCs by purposefully

ignoring the interprofessional approach and using the term "nurse-only clinics" to describe the model (Johnsen, 2008). An OMA press release in 2009 adds to this sentiment describing NPLCs as "independent" and "running directly counter to these (physician-led FHTs) integrated care models" (OMA, 2009). The press release concluded with the statement that "We need to continue to work together to ensure that every patient in this province has a family doctor" (OMA, 2009).

In response to the campaign of misinformation, the provincial government supported the NPLC model and the NP as primary care provider. The Minister of Health, David Caplan, wrote a letter to the Sudbury Star in response to one from the OMA president which denounced the NPLC model. Minister Caplan identified that the NPLCs provide comprehensive primary health care services and that the NP was the primary contact for patients (Caplan, 2009). The current government website describes NPLCs and states that "Nurse practitioners are the lead primary care providers of the clinic's interprofessional team of health care providers and support staff." (MOHLTC, 2015c, para 2).

These are only a handful of the number of attacks that were imposed on the NPLC model. Nonetheless, three waves of proposals were issued by the MOHLTC and the NPLCs were developed and opened between 2009 and 2015 (MOHLTC, 2013).

3.6 Organizational Structure of NPLCs

The original NPLC, and subsequent clinics were established to address chronic shortages of family physicians by offering comprehensive PHC to unattached and underserved patients. A focus on chronic disease management and health promotion and disease prevention in NPLCs was listed as an expectation in MOHLTC documents (Virani, 2012). A unique feature of the

NPLCs is that care is delivered through an interprofessional team approach with NP leadership (MOHLTC, 2015c; Virani, 2012). In addition to NPs, the team includes some mix of the following health care providers: physicians, RNs, registered practical nurses (RPNs), pharmacists, social workers and dieticians (MOHLTC, 2015c; Virani, 2012).

The NPLC design indicates that they are independently incorporated agencies with a community-based Board of Directors. Patients register at the NPLC and are not rostered to a physician. In the NPLC design, patients are assigned to an NP who provides full scope of practice care, but works with an interprofessional team to ensure that the expertise of each member is part of the treatment plan (Virani, 2012; Heale, 2012). NPLCs were established with electronic medical records. Partnerships with community organizations are established and NPLCs create programming related to such things as health promotion and chronic disease management (MOHLTC, 2015c). It was anticipated that the NPLCs would "use NPs appropriately to their full scope of practice" (Virani, 2012, p. 110) as NPs who are able to work to their full scope of practice, without practice barriers, are better positioned to address important gaps health care delivery through equitable access to high quality health care services and to potentially have a positive impact on the quality of care of patients with multiple chronic conditions (DiCenso, et al., 2010b).

The NPLCs have interprofessional teams like other PHC models, however, the organizational characteristics of NPLCs are different from physician-based models, in which physicians are the lead health care providers. Where there are Boards of Directors, such as in FHTs, they are most often provider boards with physician members who also work in the organization (PRA Inc., 2009; AFHTO, 2013). The NP leadership also sets NPLCs apart from CHCs which have community-based Board of Directors (Conference Board, 2012a).

3.7 Evaluating Quality of Care in Primary Health Care Models

Increasing access to primary health care services is an important feature of NPLCs, however, it is only one measure of quality of care. Some indicators that define quality PHC are the accessibility to health care services, interpersonal relationships between health care providers and patients, effectiveness of care (Campbell, Roland & Buetow, 2000; Haddad, Fournier, Machouf & Yatara, 1998; Roland, 1999), the comprehensiveness of the clinical care delivered and productive interprofessional team relationships (Stevenson, Baker, Farooqi, Sorrie & Khunti, 2001; Levesque, Feldman, Lemieux, Tourigny, Lavoie & Tousignant, 2012). Some specific indicators related to quality in PHC practices are the interval from scheduling and appointment time and the team climate, which have been associated with access to care, continuity of care and overall satisfaction (Campbell, 2001).

Research of quality of primary health care is a priority in Ontario as evidenced by the government funding of several large evaluative studies. First is The Comparison of Models of Primary Care in Ontario (COMPS-PC) study was a comprehensive review of the performance of four types of PHC agencies in Ontario in 2003-2004 including family health groups, family health networks, CHCs and health service organizations. Organizational structural components such as organizational governance, human resources, office infrastructure and organizational structure (length of time in operation, length of time for visits, hours of operation etc.) were analyzed against performance measures including such things as access, patient-provider relationship continuity of care, chronic disease management, disease prevention and health promotion (Dahrouge et al., 2009). For one set of analysis, a score was calculated which outlined the comprehensiveness of care provided in each model. This analysis found that CHCs offered significantly more comprehensive services than other models. Comprehensiveness was

associated with the presence of an interprofessional team as well as the level of maturity of the organization (Russell, Dahrouge, Tuna, Hogg, Geneau & Gebremichael, 2010).

Another component of the COMPS-PC study evaluated community orientation of the various PHC models of care. Community orientation was defined as "care providers' knowledge of community needs and involvement in the community" (Muldoon, Dahrouge, Hogg, Geneau, Russell & Shortt, 2010, p. 678). A survey adapted from the adult version of the Primary Care Assessment Tool was utilized including items about the practice environment and demographic information. A second phase of the study included provider interviews. Findings revealed that primary care providers at the PHC models in the study gave themselves high ratings for community orientation, but that indicators of community orientation were significantly higher in CHCs (Muldoon et al., 2010).

In addition to community orientation, data from the same survey tools were analyzed to determine the level of health promotion activities in the PHC models. After controlling for patient and family physician profiles, CHCs had significantly higher rates of health promotion than other models of care (Hogg et al., 2009).

Another, separate analysis in the COMPS-PC study reviewed age equity in the different PHC models (Dahrouge et al., 2011). Assessment was completed using data from patient surveys based on the Primary Care Assessment Tool and indicators from chronic disease management Canadian best practice guidelines. All models included in the study demonstrated a reduction in adherence to recommended guidelines for care of diabetes, coronary artery disease and congestive heart failure for patients age 70 and older. The exception was CHCs, which

demonstrated equivalent evidence-based care across all age groups. The authors concluded that…

> the salaried model might have an organizational structure that is more conducive to providing appropriate care across age groups and that the thrust toward adopting a capitation-based payment model is unlikely to have an effect on age disparities (Dahrouge et al., 2011, p. 1309).

Several research studies focused on PHC organizations in Ontario have been undertaken by the Institute of Clinical and Evaluative Studies. The first report compared data from CHCs, family health networks, family health groups, family health organizations and FHTs in Ontario from 2008/09 to 2009/10. Indicators were the assumed socioeconomic characteristics of patients determined by postal code, practice location of clinic, case mix and use of the Emergency Department (Glazier, Zagorski & Rayner, 2012). Compared with the Ontario population, patients at CHCs were from lower income, had higher rates on social assistance, more severe mental illness and chronic diseases than the other models of PHC. Despite the differences in patient demographics, CHCs had considerably lower rates of emergency department visits than expected (Glazier, Zagorski & Rayner, 2012).

In a separate Institute for Clinical and Evaluative Studies research study, a comparison of FHTs with CHCs, enhanced fee-for-service models (family health groups and comprehensive care model), family health organizations, family health networks, and fee-for-service family practices was undertaken (Glazier, Hutchison & Kopp, 2015). Physicians in CHCs are paid by salary. The remaining models are either blended payments (capitation or fee-for-service) in varying proportions. The study evaluated the models of care by comparing demographics, case mix, health care utilization, cancer screening and diabetes care. The results demonstrated that FHTs and other capitation models have wealthier and healthier populations than the other models. In comparison, CHCs served low-income, high immigrant populations and higher levels of

morbidity and comorbidity. While there were substantial case mix and demographic differences among the models, no model was superior to another. Fee-for-service was poorest on cancer screening and diabetes care (Glazier, Hutchison & Kopp, 2015).

Another study compared the extent to which evidence-based indicators for cardiac care were achieved in three PHC models of physician remuneration in Ontario. Chart audits were conducted at fee-for-service (N = 43), blended-capitation (N = 27) and salary-based CHC (N = 12) practices. Findings demonstrated that overall the quality of diabetes care was higher in CHCs, while offering smoking cessation medication and measuring waist circumference was higher in the blended-capitation model. Fee-for-service practices had the greatest gaps in care (Liddy, Singh, Hogg, Dahrouge & Talkjaard, 2011).

3.8 Research Related to NPLCs

There have been several studies about NPLCs since the establishment of the first in 2007. The purpose of one study, a PhD dissertation, was to examine stakeholder participation in the primary care system change process that resulted in the establishment of the first NPLC (0'Rourke, 2013). A notable finding arising from this research was that all the stakeholders, both for and against the development of the NPLC, recognized the need for improved patient access to primary health care. This finding is in alignment with and supports the Ontario government's Patient First policy which sites access as a primary goal (Ontario, 2018).

A second doctoral research study explored the development of an NPLC from the proposal stage, through to operations. As echoed in the first study, strong community advocacy and NP leadership ensured the successful development of this NPLC. The model is seen as a foundation for evidence-based practice and a catalyst for system change (Thibeault, 2011; O'Rourke, 2013).

Additional research conducted at NPLCs included analysis of patient surveys at two NPLCs. The survey was developed by two researchers and reviewed for accuracy and completeness by NPs working at one NPLC. A total of 682 patients responded to the survey for a response rate of 36.5%. Analysis demonstrated that more than 89% of the patients at the NPLC were satisfied or very satisfied with the care they received from the clinic. In addition, the majority received counselling about a lifestyle issue along with self reports of positive behavioural change and significantly higher levels of satisfaction than those who did not receive lifestyle counselling (Heale & Pilon, 2012). The second study used the same survey questions for patients at a second NPLC. Five hundred and thirty-five patients replied for a response rate of 29%. Findings were similar with respect to high levels of satisfaction, but there was also a focus on the impact of same-day access to the clinic. The ability to access a same-day appointment was significantly associated with fewer emergency department and walk-in-clinic visits and also with patient self-reported improvements in medical conditions (Heale & Fournier, 2017).

Research to date provides a foundation for this PhD study. In part, establishment of NPLCs was successful because of some stakeholder and community support and the clinics were developed in spite of some exceptional challenges (O'Rourke, 2013; Thibeault, 2011). Smaller studies demonstrate high patient satisfaction and self-reported improvements in health (Heale & Fournier, 2017; Heale and Pilon, 2012). However, the NPLC model itself has not been part of evaluative research studies like other, well-established models. In particular, there is a gap in what is known about how the delivery of care arising from the NPLC model impacts the quality of care for patients. For one, in physician-based models the health care contacts of patients 'rostered' to individual physicians are added to large datasets. Care contacts are connected to the physician and this data can be then retrieved for research purposes. Since patients are not

'rostered' to NPs and their health care activity is not added to datasets, NP practice data are not easily retrieved for comparative review with other PHC models (Glazier, Hogg & Kopp, 2015).

Organizational accountability is expected, as seen in the parameters of the *Excellent Care for All Act* and Quality Improvement Plans documents (Ontario, 2012). Research focused on PHC models has demonstrated that patient characteristics, community needs, comprehensiveness of care delivered, interprofessional team relationships and organizational policies and practices of PHC models may influence the quality of care that patients receive (Dahrouge et al., 2009; Glazier, Zagorski & Rayner, 2012; Hogg et al., 2009; Muldoon, et al.,2010; Russell, Dahrouge, Tuna, Hogg, Geneau & Gebremichael, 2010). Research about PHC organizations provides a foundation for improvements to patient care, the impact of health policies on patient care and may inform the development of additional PHC clinics. No data existed related to the quality of care delivery within the NPLC model. Thus, a study of the NPLC model was warranted to ensure that both areas of high quality as well as gaps are identified and addressed. To this end, a multiple case study exploring the quality of care for patients with diabetes and multimorbidity was undertaken in five NPLCs in Ontario.

Chapter 4

4 Theoretical Frameworks and Methods Overview

4.1 Purpose

The purpose of this research was to explore the relationship between organizational processes and the quality of care of diabetic patients with multimorbidity in NPLCs in the North East and North Simcoe Muskoka LHINs.

4.2 Research Questions

These research questions guided this study.

1. What are the relationships between organizational characteristics in the NPLC model and the care of diabetic patients with multimorbidity?
2. To what extent are clinical practice guideline indicators for diabetes care being met for patients with multimorbidity in NPLCs in the NE and NSM LHINs?
3. How do nurse practitioners at NPLCs in the NE and NSM LHINs evaluate the impact of the NPLC model on the quality of the care they provide to diabetic patients with multimorbidity?

4.3 Research Design

This study was a mixed methods multiple case study design. There were three methods of data collection for this multiple case study. The first was a chart audit for patients with diabetes and multimorbidity in the five NPLCs. Secondly, NPs from the NPLCs were interviewed. Finally, organizational and health system data were collected from a variety of sources including

members of the NPLC Board of Directors and NPLC staff, media releases and other grey literature related to NPLC development and Ontario health policy.

There are both drawbacks and advantages of utilizing different types of data in this multiple case study. The collection and analysis of multiple data sources has the potential to mitigate limitations of each individually and draw upon the strengths of the data as a whole (Byrne, 2007). However, the process results in immense amounts of data, which may cloud the overall objectives during the multiple case analysis stage (Stake, 2006). A strategy to ameliorate the tendency to become overwhelmed was to analyze and report on each dataset separately as much as possible before conducting the multiple case analysis. Thus, the thesis is structured into three articles. The first is an article related to the review of NP's perception of the quality of care of patients with diabetes and multimorbidity in NPLCs. The article titled "Nurse Practitioner's Perceptions of the Impact of the NPLC Model on the Quality of Care of Complex Patients" was published in Primary Health care Research and Development. This is followed by an article that includes findings of the chart audit titled "The Quality of Care of Patients with Diabetes and Multimorbidity Registered at NPLCs," which has been published in the Canadian Journal of Nursing Research. Finally, a multiple case analysis was undertaken and presented in an article. "A Multiple Case Study in Nurse Practitioner-Led Clinics: An Exploration of the Quality of Care for Patients with Multimorbidity." The final article was published in the Canadian Journal of Nursing Leadership in 2016. Each chapter, or article, begins with an introduction about the focus and methods for the article. Description of methods and analysis are embedded within the articles. The final article is followed by reflections about the limitations of the thesis as well as the potential impact of the study.

4.4 Study Frameworks

Choosing a framework was an important step in this research. Theoretical and conceptual frameworks are helpful in defining and discussing the relationship among concepts. When utilized in research, a conceptual framework offers a structure for the explanation of the analysis of research data and positions the findings within a specific context (Liehr, Smith & Cameron, 2009). A framework ensured a common understanding of the concepts in this study and provided a platform for the discussion of relationships and meaning of the findings.

There are a number of models that were developed to be used as a framework for the evaluation of quality in health care (Arah, 2003; Arah 2006; Babitsch, Gohl, & von Lengerke, 2012; Agency for Health care Research and Quality, 2007. These models focus on individuals, organizations, health care systems and more. A review of a number of these models revealed the framework that offered the best fit for this study.

The concept of 'quality' was foundational to this multiple case study of NPLCs. Arah (2003) reviewed and compared conceptual frameworks for health system performance in four countries, the UK, Canada, Australia and USA. The comparison revealed that quality in health systems was typically measured by the extent to which quality goals and indicators had been attained (Arah, 2003). Several frameworks were reviewed in more depth including the Anderson Behavior Framework, the Organization for Economic Co-Operation and Development (OECD) framework and World Health Organization (WHO) model. This is followed by discussion about the Donabedian Quality Framework.

The Anderson Behavior Framework focuses specifically on evaluation of individuals' and families' use of the health care system and to define and promote equitable access to care

(Babitsch, Gohl, & von Lengerke, 2012; WHO, 2006). It has been used as the framework in research in a variety of ways including the use of health care services by individuals and to model the response of clinicians to quality based payment incentives (Agency for Health care Research and Quality, 2007). The Andersen Behavior Framework is a good model for defining and understanding coordination in the health care system. However, this model doesn't provide a framework for studying a single health care organization including not only patient perspectives and activities, but also the processes internal and external to the clinic that impact the quality of care related to the PHC model. Therefore, this model is not a good fit with this research, focusing on the NPLC.

The OECD developed a conceptual framework to define 'quality of health care'. This work supported the Health care Quality Indicators Project, an international initiative, where quality indicators were developed to be used for health system performance measurement (Arah, 2006). The conceptual framework depicted linkages between health care and health, using determinants of health (both health and non-health) as key components (Arah, 2006). Again, this model is focused more on the health care system as a whole and does not provide a simple mechanism for evaluation of a single model of primary health care.

The WHO developed a tool with the purpose of building capacity in health care quality. It is meant to guide decision makers in deciding which components in the health care system are a priority and which to direct attention to. The WHO document defines quality in health care as that which is effective, efficient and accessible, acceptable/patient-centered, equitable and safe (WHO, 2006). The model outlines a process for choosing quality goals, planning, implementing and evaluating strategies for enhancing quality in a health care system (WHO, 2006). The purpose of the multiple case study of NPLCs was not to develop capacity for building quality in

health care. Rather it was to evaluate the level of quality of health care in NPLCs. Thus, the WHO model was not appropriate.

4.4.1 Donabedian Quality Framework

The Donabedian Quality Framework offered a foundation for the study of NPLCs in this study. Avedis Donabedian developed a model to describe the processes of quality in health care. Donabedian (2005) started by identifying how difficult is it to define 'quality' in health care and he concluded by stating that there is no single definition that fits. There are a multitude of possible definitions and that the approach to the assessment of health care will depend on the criteria selected to define quality.

Donabedian (2003) offered his own definition of 'quality' as the product of science and technology of health care as well as the application of that science and technology in practice. The product is characterized by a number of attributes including efficacy, effectiveness, efficiency, optimality, acceptability, legitimacy and equity. Table 1 offers a brief definition of each component.

Table 4.1: Components of Quality: Definitions

1.	**Efficacy.** The ability of the science and technology of health care to bring about improvements in health when used under the most favorable circumstances.
2.	**Effectiveness.** The degree to which attainable improvements in health are, in fact, attained.
3.	**Efficiency.** The ability to lower the cost of care without diminishing attainable improvements in health.
4.	**Optimality.** The balancing of improvements in health against the costs of such improvements.
5.	**Acceptability.** Conformity to the wishes, desires, and expectations of patients and their families.
6.	**Legitimacy.** Conformity to social preferences as expressed in ethical principles, values, norms, mores, laws, and regulations.
7.	**Equity.** Conformity to a principle that determines what is just and fair in the distribution of health care and its benefits among members of the population.

(Donabedian, 2003, Table 1.1, p. 6)

The components of quality can be used in whole, or in part, to monitor the level of quality in health care (Donabedian, 2003). Two components including efficiency and optimality, reflect on the costs of health care, which are not the focus of this study. However, Donabedian (2003) identifies 'clinical efficiency' within the larger component, which refers to individual health care providers' use of the best and most effective practice, which was the focus of this research.

Acceptability of care is further broken down to reflect on the ease to which a patient is able to receive care. It also reflects the integrity of the patient-provider relationship, the extent to which patients agree with practitioners about the risks and benefits of the health care they receive and the level of equity perceived by patients. Issues of health care equity were explored in this study. Finally, the amenities of care themselves, are part of the component of acceptability (Donabedian, 2003).

A definition of quality is the foundation in ensuring, or evaluating quality in health care. However, the definition depends on the context of assessment, the criteria that is most relevant and on the items that are controllable (Donabedian, 2003). Once a definition of quality has been determined, assessment follows. This includes choosing among three approaches in assessing quality of care; structure, process and/or outcome (Donabedian, 2003). Structure refers to the conditions in which care is provided, or the way that health care is set up. This includes material and human resources as well as organizational characteristics (Donabedian, 2003). Process refers to the activities that constitute health care such as diagnosis, treatment, patient education and more. Process activities are carried out both by health care providers as well as patients and their families. Outcome is the desirable or undesirable changes that can be attributed to health care (Donabedian, 2003).

Donabedian (2003) clarifies that "structure, process and outcome are not attributes of quality. They are only kinds of information one can obtain, based on which one can infer whether quality is good or not" (p. 47). A predetermined relationship among structure-process-outcome is essential in order to draw inferences about quality. However, relationships between the three components are presumed to exist, but are not certainties and interaction between the model components is often much more complex than is represented in this linear format. The final caution that Donabedian (2003) issues is that the structure-process-outcome model was developed to assess clinical practice and related features. Use of the model in other circumstances may not appropriate.

The Structure-Process-Outcome model provides a framework for the evaluation of quality in health care. There are benefits and drawbacks to each of the three approaches. Evaluative strategies may use one or more of the three approaches and 'the precise mix of which is to be determined by the nature of the problem to be studied and the availability of the information needed" (Donabedian, 2003, p. 56).

One of the important features of Donabedian's framework is the consideration of structure and quality. A good amount of evidence in quality related to process and outcomes, but much less so on structure, in particular, organizational design (Glickman, Baggett, Krubert, Peterson & Schulman, 2007). "Organizational design is a formal, guided process for integrating the people, information, and technology of an organization, and serves as a key structural element …" (Glickman et al., 2007, p. 344). Organizational design is a variable in performance and quality outcomes. Quality improvement research should focus on identifying how the relationship between organizational attributes is related to quality of care (Glickman et al., 2007).

In this multiple case study, the components of Structure and Process were utilized to evaluate the quality of care for patients with diabetes and multimorbidity at NPLCs. Definitions of components for each category were developed and analysis of the data was used to reflect back on the relationship between the elements within Structure and Process in NPLCs and their impact on the quality of care of patients with diabetes and multimorbidity. The following table outlines the core elements captured in each component of the framework.

Table 4.2: Core Elements of NPLC Multiple Case Study

Structure	Process	Outcomes
− NPLC organizational characteristics − Human Resources − Health Policy − Community Health Resources	− Best practice guidelines for diabetes and multimorbidity care − Health education programs and processes − Interprofessional team approach	Not applicable

4.4.2 The Chronic Care Model

Donabedian's (2003) Structure-Process-Outcome Model provided a theoretical framework for the evaluation of quality of care in the five NPLCs and in the interpretation of findings in the multiple case study. However, the Chronic Care Model (CCM) was used to identify and define specific items in the evaluation of quality of care of patients with chronic diseases in PHC settings.

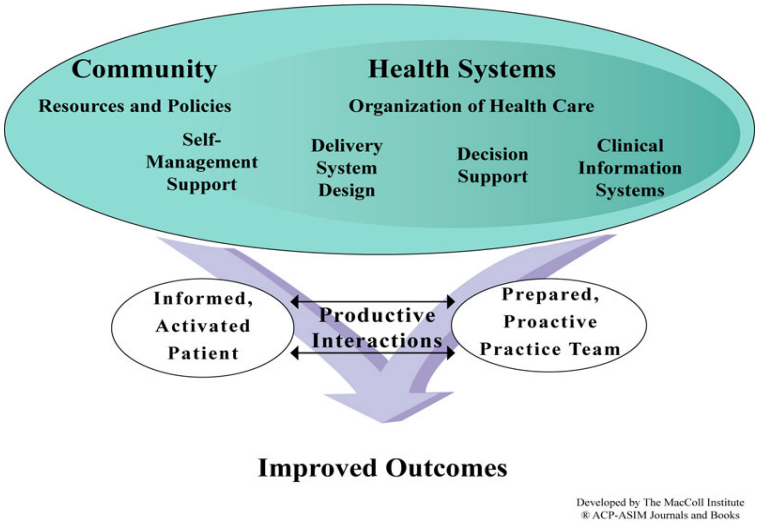
The CCM was developed by a staff at the Group Health Research Institute in the US in the mid-1990s. The elements of the CCM were derived through review of literature about effective strategies for management of chronic illness (Group Health Research Institute, 2016b). The model has been updated several times, through input from panels of experts. The elements of the model have been used to guide the collection of data and analysis in evaluative studies of

innovative chronic disease programs and health care settings (Group Health Research Institute, 2016b).

The CCM summarizes the elements required for improving care of patients with chronic diseases at the community, organizational, practice and patient levels (Group Health Research Institute, 2016a). In the CCM, health care teams help to optimize patient outcomes through a series of interactions including clinical evaluation with the integration of the patient's perspective. The team helps patients to improve self-management, works to prevent complications, optimizes disease control and ensures patient well-being. Finally, PHC teams provide continuous follow-up (Wagner, 1998).

The CCM was chosen as a guide to the specific items for analysis in this study for several reasons. First, the Canadian Diabetes Association (CDA) recommends that the care of patients in family practice be aligned with the CCM (CDA, 2013). The CCM is the framework for chronic care management in provincial as well as federal reports (MOHLTC, 2007; Cordero, 2007). The CCM has been used to guide research studies and to frame discussion about chronic care management in Canadian, as well as international settings (Asch et al., 2005; Coleman, Austin, Brach, & Wagner, 2009; Johnston, Liddy, Mill, & Irving, 2012; McCurdy, MacKay, Badley, Veinot & Cott, 2008; Vargas et al., 2007). The extensive use of the CCM provided a common understanding for the organizational variables included in this study.

Figure 4.1: The Chronic Care Model



Group Health Research Institute (2016a)

The CCM was used as a guide to create a list of organizational characteristics of NPLCs. Organizational items were categorized according to the organizational components of the CCM with specific items arising from the literature (Asch et al., 2005; Pearson et al., 2005; Wagner, Austin, Davis, Hindmarsh, Schaefer & Bonomi, 2001). The CCM also guided the development of semi-structured questions for NP interviews. What follows is an outline of the items identified and link to the CCM.

The structure of the NPLC team approach was matched to the structures of CCM in this study. In the CCM, the nature of the interaction between the patients and health care providers is an essential component of improved health outcomes. Productive interactions between patients and providers are achieved when the patients are well informed about their conditions and have the skills and confidence to interact with the health care team. Interactions are more likely to be productive if patients are active, informed participants in their care. Health care providers must have relevant patient data, time, resources and expertise to ensure effective management of chronic conditions (Cordero, 2007; Group Health Research Institute, 2016a; McCurdy et al.,

2008; MOHLTC, 2007; Wagner, 1998). These items were considered in the development of semi-structured questions for NP interviews. Health care team interactions were evaluated through a chart audit that included the number of consultations between NPs and physicians in the NPLCs.

The CCM highlights the role of the community (resources and policies) and health systems (organization of health care) in chronic disease management. Items in a chart audit of the NPLC organizations, one component of data collection in the multiple case study, included items from these two elements. 'Community' items included whether patients were referred to and/or attended a community group, such as a diabetes education group. 'Delivery system design' refers to effective interprofessional team functioning and practice systems including appointments and follow-up with the patients with chronic disease. Chart audit items for these included such things as number of patient clinic and telephone appointments as well as which health care providers were seen and how often. 'Decision support' includes the development of systems to support implementation of evidence-based guidelines that ensure providers are educated and have appropriate reminders and prompts. Related chart audit items were developed such as the presence and use of a template to chart diabetes care. Finally, 'clinical information systems' are such things as registries, tracking systems and reminders to give feedback on patient care and performance. The use of reminders within the electronic medical record were reviewed (Cordero, 2007; Group Health Research Institute, 2016b; McCurdy et al., 2008; MOHLTC, 2007; Wagner et al., 2001).

Table 4.3: Study Variables Arising from Chronic Care Model

Community	Referral or attendance at community group
Health Systems	
Delivery System Design	Number of clinic and telephone appointments
Decision Support	Diabetes care template
Clinical Information Systems	Reminders in electronic medical record (EMR)

4.4.2.1 Multiple Case Study

A case study of the NPLC model was valuable because it is a qualitative methodology that is a pragmatic, flexible and which results in a comprehensive, in-depth understanding of complex issues in a real-world setting (Harrison, Birks, Franklin & Mills, 2017). Case study methodology has undergone substantial development in the past 40 years which has benefitted from the influence of diverse disciplines, each of which offer their unique perspectives and ontological and epistemological orientations (Harrison et al., 2017). Despite the differences, there are common characteristics to all including a flexible approach to investigation of a complex issue, influenced by many variables and in which boundaries for cases are not always clear. What follows is a review and comparison of the approaches taken by three methodologists in the development of case study research, Robert Stake, Sharan Merriam and Robert Yin. A summary provides the rationale for the use of Stake's multiple case analysis for this study.

Evaluation of the philosophical underpinnings of case study design, arising from the development of the individual methodologies, reveals differences between the three approaches. Stake (1995) used a constructivist orientation to case study. This placed more of an emphasis on inductive exploration, discovery and holistic analysis. Yin incorporated a post-positivist paradigm. Merriam (2009) drew upon the approaches of both Yin and Stake. The three

approaches rest along a quantitative-qualitative continuum: Yin (post postitivist) on one end and Stake (interpretivist design) on the other end. Merriam has elements of both (Harrison et al, 2017). A review of each in more depth gives a framework arising from the philosophical grounding of case study methodology.

4.4.2.2 Yin: Realist and Postpostivist

From a realist perspective, Yin's methodology recognizes that case study research is part of the real-world and, therefore, measurement isn't precise. Because of this, he promoted the use of multiple methods of data collection and triangulation. From a post-postivitist perspective, there is an understanding in Yin's methodology that there is bias in research, which influences the results. As such, the case study design in Yin's work encourages minimal interaction between the researcher and subjects. In Yin's methodology, objectivity, validity and generalizability are the underlying objectives (Yazan, 2015).

In Yin's work, a case is a real-world phenomenon with poorly defined and/or controlled boundaries. A case study is "an empirical inquiry that investigates the case or cases ...by addressing the "how" or "why" questions concerning the phenomenon of interest." (Yazan, 2015, p. 7). There is a strong emphasis on a well-planned research design with compatibility and cohesiveness of the data collection methods, a drive for overall quality of research methods and techniques, including a pilot study of the entire case study research project (Yazan, 2015). Yin outlines strict guidelines for data collection and highly structured analytic guidelines and principles during the data analysis processes (Yazan, 2015).

4.4.2.3 Merriam: Pragmatic Constructivist

In Merriam's approach to case study research, "reality is constructed by individuals interacting with their social worlds" (Merriam, 1998, p. 6). This methodology encourages strategies toward data collection that help to sort and manage large amounts of data and to interpret it so that the findings are clear and applicable (Harrison, et al., 2017). The purpose of case study research and analysis is to understand how people make sense of their world and their experiences within it (Yazan, 2015). There is an understanding that researchers bring their own constructed reality to the study, which interacts with, and is part of the interpretation of the participant's reality (Yazan, 2015).

The definition of a case is flexible and includes any phenomenon that has a bounded context (Yazan, 2015). Merriam's methodology includes a clear approach to literature review related to the case as well as to support a theoretical framework. The approach to the research design is not as rigid as Yin's but does set guidelines for such things as sampling techniques. In this methodology, a pilot of the full case study is not required (Yazan, 2015). Data collection may be qualitative and/or quantitative, but should focus on inductive reasoning rather than hypothesis testing (Harrison, et al., 2017). Merriam outlines processes and guidelines for data collection and, while recognizing the role of the researcher in interpretation of the data, she provides guidelines for analytic processes to reveal the reality of the participants (Yazan, 2015). Validity for the findings is achieved through provision of sound rationale from different sources (Yazan, 2015).

4.4.2.4 Stake: Relativist-Constructivist/Interpretivist

Stake's methodology toward case study research is different in that there is a strong emphasis on the critical role of the researcher in producing and interpreting knowledge (Yazan, 2015). The

researcher is interactive, participates in the study and is positioned as a partner with the participants in the generation of knowledge in that "situation shapes activity, experience, and one's interpretation of the case" (Harrison, et al., 2017, p. 8). "The researcher attempts to capture her or his interpreted reality of the case, while studying the case situationally enables an examination of the integrated system in which the case unfolds" (p. 8)

In this design, a strong motivation for discovering meaning and understanding of experiences within a specific context is the overarching purpose of the research (Harrison, et al., 2017). The definition of a case is broad and Stake alludes to cases as complex, integrated, bounded systems (Yazan, 2015). Stake argues for well defined research questions that form a framework for the initial design, but from there he supports a flexible design approach which allows for major changes to the design as required to address the research questions. A pilot of the case study is not required (Yazan, 2015). There are no strict guidelines for data collection and there is an emphasis "...on researchers' impressions as the main source of data and making sense of them as the analysis." (Yazan, 2015, p. 145). In this case study research validity is determined through triangulation and reflection (Yazan, 2015).

The methods of investigation are not crucial in Stake's case study research (1998), rather the methods are defined by the issues of interest in individual cases (Johansson, 2003). Different methods can be combined to provide insight into the case from different angles, to triangulate by combining different methods of data collection and analysis. The findings in Stake's case study methodology arise from multiple and subjective views of reality, which are based on the meanings and understandings of the researcher and participants (Harrison et al, 2017).

4.4.2.5 Methodology for this Multiple Case Study

Several characteristics of Stake's multiple case methodology made it the most suitable for this study. The definition of a case, as an integrated system which has fluid boundaries and context, is well aligned with the NPLC model which includes the interplay between the physical entity including staff, patients as well as the influence of outside system factors such as policies. The flexibility in the approach to data collection provided a format for updating the documentation related to NPLCs, which was constantly changing during the research process. However, the most important element in Stake's methodology is the role of the researcher. Given my close ties to the implementation and development of the NPLC model, as well as in the NP community in Ontario, it would be next to impossible for me to separate myself and my interpretations from the analysis. Since these are integral components to Stake's case study approach, it confirms that this was the most appropriate methodology for this research.

4.4.3 Setting: The North East and North Simcoe Muskoka LHINs

The purpose of examination of several cases in a multiple case study is to recognize multiple realities, but also to seek assertions common to the whole (Stake, 2006). With this in mind, the NPLCs that were selected had different levels of organizational maturity, differing community and human resources, and were from both rural and urban areas. However, they were positioned in similar geographical areas, with similar population health profiles and health care needs. Thus, this study not only focused on the NPLC model, but also on cases of the model within a unique environment.

This research was conducted at the Sudbury District Nurse Practitioner Clinics, Capreol NPLC, French River NPLC and North Bay NPLC in the North East Local Health Integration Network (NELHIN) and the North Muskoka NPLC in the NSMLHIN. The clinics are positioned both in

northern rural and northern urban areas (MOHLTC, 2010). There are many unique health status features that justify focusing my research in this area of the province. The North Muskoka NPLC, although not in a district included in the MOHLTC definition of 'northern', is as far north as Parry Sound. In addition, the town of Huntsville where the North Muskoka NPLC is located falls into the MOHLTC definition of rural in that it has fewer than 30,000 people and is 1.5 hours away from a centre with more than 30,000 people (MOHLTC, 2010).

North eastern Ontario has distinctive characteristics. The proportion of the population greater than age 65 is higher in the NELHIN than Ontario (NELHIN, 2012). The median age in the NELHIN is 42.9 years, which is older than the Ontario median age of 39.0 years. The median age of women in the NELHIN is 43.5 years compared to 39.9 years for women in Ontario (Statistics Canada, 2016). People in the NELHIN earn less money, and have lower perceived health and mental health status than people in Ontario (Statistics Canada, 2013, 2016). In addition, the proportion of people with Aboriginal identity is 9.5% compared to Ontario at 2.0%. The proportion of Francophones is 22% compared to 4.4% for Ontario (NELHIN, 2013). Thus, language and care related to culture are important considerations in PHC in the NELHIN.

The town of Huntsville has similar characteristics to the NPLC communities in the NE LHIN. The population of Huntsville is older than that of the Ontario population median age is 45.7 compared to 40.6 for Ontario in 2011 (Statistics Canada, 2014a). Huntsville has a lower employment rate and lower median income than Ontario (Statistics Canada, 2014a). However, in contrast, only 2.7% of the population in Huntsville identifies as Aboriginal and only 1.5% identifies as Francophone (Statistics Canada, 2014b).

Challenges in the delivery of PHC are reflected in the poorer health status of people in the NE and NSM LHINs. In particular, these areas post poor results for most chronic disease management indicators compared to other areas in Ontario (HQO, 2015). Chronic disease management is a key issue in PHC as identified by HQO (2015) and is an important focus of the proposed research of the NPLCs in the NE and NSM LHINs (NSM LHIN, 2013).

4.5 Chronic Disease and Multimorbidity

Chronic disease management includes the care of those with chronic conditions. Noncommunicable, or chronic diseases, are the leading causes of death globally, specifically cardiovascular disease, diabetes, chronic obstructive pulmonary disease and cancer (WHO, 2010). In 2008, 63% of deaths globally were attributed to chronic disease. More people die of chronic diseases each year than all other causes of death combined (WHO, 2010). A large percentage of deaths related to chronic disease are preventable through cost-effective and feasible interventions such as reduction of tobacco use, increase physical activity, reduction of harmful use of alcohol, better diets, blood pressure control, lowering rates of obesity, lowering cholesterol and reducing cancer related infections such as Hepatitis B & C, Helicobacter pylori and Human Papilloma Virus (WHO, 2010). Low and middle-income populations, those with lower education as well as the vulnerable and socially disadvantaged (Nagel, Peter, Braig, Hermann, Rohrmann & Linseisen, 2008) are more highly affected by chronic disease (Starfield, 2003; WHO, 2010).

An additional issue which complicates care of those with chronic disease is the management of patients with two or more chronic diseases, or multimorbidity. There is no one definition of multimorbidity and single index definitions cannot predict a variety of relevant outcomes (Aarts, van den Akker, Tan, & Treloar, 2012; Byles, D'Este, Parkinson, O'Connell, & Treloar, 2005;

Fortin, Lapointe, Hudon, & Vanasse, 2005; van den Akker, Buntinx, Metsemakers & Knottnerus, 2000). Issues such as the severity of individual chronic conditions combined, or constructs such as frailty, are often not taken into consideration in research studies (Aarts et al., 2012; Fortin et al., 2005). Multimorbidity is most commonly defined as the presence of two or more chronic diseases (Fortin et al., 2005; Institute for Clinical and Evaluative Studies, 2006).

Studies demonstrate that multimorbidity is very common in primary health care practice (Aarts et al., 2012; Bower et al., 2011; Fortin, 2005; Fortin et al., 2005). There is a higher prevalence of multiple chronic diseases in the NELHIN than in Ontario; 21.5% NELHIN compared to 15% Ontario (NELHIN, 2012). People with multimorbidity use the health care system more often and health care costs for this group are greater (Brilleman, Gravelle, Hollinghurst, Purdy, Salisbury & Windmeijer, 2014; Glynn et al., 2011; Marengoni et al., 2011).

Research suggests that health care practitioners struggle with the care of patients with multimorbidity. Family physicians have reported a lack of confidence, reduced clinical competence and difficulties in managing complex health situations of patients with multimorbidity (Bower et al., 2011). PHC providers experience barriers to care of patients with multimorbidity including time constraints and clinical guidelines with limited consideration of multiple concurrent conditions and the interactions between them (Bower et al., 2011; Fortin, Soubhi, Hudon, Bayliss & van der Akker, 2007; Smith, O'Kelly & O'Dowd, 2010). Providers tend to address problems in order of priority and defer some to other appointments (Bower et al., 2011). Additionally, some physician practices limit patients to one issue per visit, which further impedes their ability to manage multimorbidity (College of Physicians and Surgeons of Ontario, 2011). Other barriers are patient self-care and coordination issues and difficulty differentiating

between physical and mental health in providing clinical treatment (Bower et al., 2011; Fortin et al., 2007).

Patients with multimorbidity are less likely to receive continuity of care, but more likely to benefit from it (Salisbury, Johnson, Purdy, Valderas, & Montgomery, 2011). Comprehensive programs of care, specifically those that address provider-patient communication, interpersonal treatment, knowledge of patient, integration of care and trust in health care provider, improve the quality of care of patients with multimorbidity (Boyd et al., 2008; de Bruin et al., 2012). The NPLCs are designed to provide comprehensive PHC services (Virani, 2012), to increase accessibility to appointments and to see patients for more than one problem per visit (MOHLTC, 2015b; Virani, 2012), however, the barriers to the delivery of care to patients with multimorbidity are not known in NPLCs and were explored in this research study.

4.6 Clinical Practice Guidelines and Diabetes Management

Clinical practice guidelines (CPGs) are templates and algorithms used to care for patients with chronic disease. They are developed through the review of evidence and expert panel consensus (National Institute for Health care Excellence [NICE], 2012; Palda, Davis & Goldman, 2007). CPGs offer recommendations for the care of patients and may be used as a guide for clinical practice (NICE, 2012; Palda et al., 2007). Implementation of CPGs in PHC is considered to be best practice for care of patients with chronic diseases (NICE, 2012).

CPGs often include indicators that monitor disease and are used to adjust treatment, such as blood work to monitor glucose in patients with diabetes (CDA, 2008). CPGs also include indicators that reflect preventative care strategies. These indicators address areas for health promotion that slow the progression of disease and may prevent the development of additional

chronic conditions (Starfield, 2001). Smoking cessation and waist circumference measurements are a few examples of preventative indicators (Champlain Cardiovascular Disease Prevention Network, 2012). A drawback to implementation of CPGs is that they most often focus on one chronic condition. Multimorbidity is often not taken into consideration and the care of one condition may conflict with that of another (Luck, Peabody, Dresselhaus, Lee & Glassman, 2000).

Despite the value of CPGs for chronic disease management in PHC, they are not implemented by all health care providers (Harris et al., 2006) Along with the complexity of multimorbidity, there are other factors that influence the provision of care for patients in PHC settings, such as organizational factors (Russell et al., 2009, 2010). For example, an organization's scheduling process may result in long intervals between appointments, which impedes appropriate care of chronic conditions.

A focus of this study was multimorbity, in particular patients with diabetes mellitus, or simply 'diabetes' and at least one other chronic condition. It is important to focus on diabetes because it is one of the most complex chronic conditions that is managed routinely in PHC settings (Agarwal, Kaczorowski & Hanna, 2012; CDA, 2013; Harris et al., 2006). The care of patients with diabetes along with other chronic conditions is one measure of the ability of an organization to address complex health issues.

Diabetes is a disease characterized by dysfunction of the body's insulin/glucose management system that results in blood glucose levels above normal. This increase often happens slowly and, if not diagnosed and treated, the ongoing elevated blood sugar levels lead to devastating complications such as heart disease, kidney failure, gangrene of limbs with amputation and

blindness (CDA, 2008). In addition, people with diabetes not only suffer from high rates of related conditions and complications from poor control, but also higher rates of morbidity and mortality than their non-diabetic counterparts (CDA, 2013). Care in a PHC setting can help the patient to offset and prevent complications.

The study of patients with diabetes and multimorbidity in the NPLCs in the NE and NSM LHINs was relevant because rates of diabetes mellitus are rising across the province and are higher in the NELHIN than the rates for Ontario (Institute for Clinical and Evaluative Studies, 2003). Diabetes affects 8% of the total population in the NELHIN, reaching as high as 20% in some districts (NELHIN, 2012). In the NSM LHIN the rates of diabetes are among the highest in Ontario with diabetes cited as a leading cause of death (NSM LHIN, 2013). Patients with diabetes often have additional chronic conditions (CDA, 2013; Harris et al., 2006; Institute for Clinical and Evaluative Studies, 2003). The negative impact of diabetes on quality of life of patients is enormous. In addition, the health care costs of diabetes and related conditions are expected to rise almost 50% in the upcoming years (Cordero, 2007). Evaluation of the quality of diabetes care for patients with additional chronic conditions in NPLCs is an important step.

The Canadian Diabetes Association has developed a CPG with recommendations on screening, prevention of diabetes and complications, diagnosis, education, care and management of diabetes (CDA, 2008). The association states that quality care for patients with diabetes is best achieved with an interprofessional team approach, links to community resources and collaboration with specialists (CDA, 2013). The care provided to patients at the NPLCs with complex conditions such as diabetes, complicated further by additional chronic conditions, may provide a snapshot of the ability of the organization to address complex needs of patients with multiple concerns.

4.7 Definitions of Key Concepts

Quality: For the purpose of this study, quality was defined as the degree to which diabetic CPGs were met in patients with diabetes and multimorbidity in NPLCs in the NE and NSM LHIN.

Multimorbidity: In this research multimorbidity was "the simultaneous coexistence of more than one chronic condition in a single individual" (Glynn et al., 2011, p. 516).

Organizational Characteristics: The definition of organizational characteristics in this study was derived from the CCM and are described in depth in the articles, particularly in the chart audit article (Asch et al., 2005; Group Health Research Institute, 2016a; Wagner, 1998; Wagner et al., 2001). They included attended a diabetes education group (community); health care providers seen and number of appointments (delivery system design); use of diabetes clinical guidelines (decision support) and EMR tracking (clinical information systems).

Clinical Practice Guidelines for Diabetes Care: The indicators for CPGs for diabetes care were derived from the 2008 Canadian Diabetes Association Clinical Practice Guidelines (CDA, 2008; Agarwal et al., 2012).

Nurse Practitioner-Led Clinic: NPLCs are independently incorporated primary health care agencies with community-based Board of Directors. The NPLC is an interprofessional model of primary health care with the mission to increase access to primary health care services. Unattached patients register to the NPLC and are assigned to an NP who provides their core health services (Virani, 2012).

Primary Health Care: PHC refers to a health care sector within the health care system (Muldoon et al., 2006). PHC organizations are the agencies within this health care sector in

which comprehensive, community-based, family practice health care is delivered. Primary care providers are those health care personnel who are most accountable for comprehensive, family practice care of a group of patients (Muldoon et al., 2006).

4.8 Ethical Considerations

This study received approval from Laurentian University Research Ethics Board [Certificate #2014-01-08]. In addition, approval for the study was obtained from the Board of Directors of each of the NPLCs included in the study.

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Chapter 5

5 Article #1: Nurse Practitioner Interviews

5.1 Preface to Article #1

An important step in the multiple case analysis was in conducting interviews with NPs practicing in NPLCs. Interview data provides "...new knowledge pertaining to the subjective, experiential, tacit and patterned aspects of human health experience" (Thorne, 2008, p. 36). In this case, the experiences and insights of NPs describe the unique perspective of the primary care providers in NPLCs. The data and analysis of the NP interviews addressed the research question: *How do nurse practitioners at the NPLCs evaluate the impact of the NPLC model on the quality of the care they provide to patients with multimorbidity?*

Eight interviews were completed and analyzed using interpretive description (Hunt, 2011). Interpretive description is a qualitative research methodology which was developed to meet the need for a method that focuses on health care issues, which didn't fit traditional qualitative methodologies, but were also not generic in nature. It is an extension of traditional qualitative designs that allows the researcher to examine a clinical phenomenon and the purpose of interpretive description is to generate knowledge related to a specific clinical context (Hunt, 2009). In interpretive description "the researcher's foreknowledge of the phenomenon under study is considered to be a platform on which to design the project, and helps to establish its anticipated boundaries" (Hunt, 2009, p. 1285). Given my close link to the development of the NPLC model, a qualitative design that acknowledges the researcher's experience with the phenomenon of study was the most appropriate for this study.

The researcher's experience is acknowledged and bracketing is not a feature of interpretive description, nonetheless, biases need to be addressed (Hunt, 2009; Thorne, Kirkfield & Esme, 1997; Thorne et al., 2004). Several strategies were implemented by the researcher to mitigate the impact of researcher bias. The first was the utilization of a reflective journal which helps with the recognition of personal biases. Field notes provided information in addition to the interview transcript, which may also highlight areas of bias. Repeated interviewing and returning to participants for their input into the findings and themes was also implemented to ensure that the researcher's interpretation was in alignment with the understanding and experience of the participants (Thorne et al., 1997; Thorne, 2008). Utilization of multiple sources of data, such as literature, was included in the analysis to provide subjective knowledge to enlighten the researcher as to underlying beliefs, attitudes or opinions. Triangulation was also used to support the themes derived from analysis and to lend credibility to the findings (Thorne, 2008).

5.1.1 Additional Detail Regarding Sample and Recruitment for Article #1

The choice of participants was purposeful and included any NPs who were employed either part or full time at one of the five NPLCs included in the study (Hunt, 2009; Thorne et al., 2004). An NP clinic lead with whom I have a close professional relationship, was excluded from the pool of potential participants. The potential number of NPs for interview in the five NPLCs was 19. Once the chart audit was completed for a specific NPLC, an email invitation to participate in the interview was sent to the eligible NPs in the NPLC. A total of 8 telephone interviews were conducted representing NPs employed at four of the five NPLCs in the study.

No specific sample size is expected in interpretive description design and most studies include a range from 5-30 participants (Thorne, 2008). Rather, the sample size needs to be consistent with the research question and provide enough data to adequately support the findings (Thorne, 2008).

In this case, the potential number of participants was low, but there were no other NPs available to address the research question about quality of diabetes and multimorbidity care in the five NPLCs. Because of their unique position in NPLCs, as primary care providers and clinic leads, only NPs from the NPLC interprofessional teams were interviewed. Given the relatively small number of participants, it was important to seek participant feedback on the developing themes in the analysis and to include data from multiple sources.

There was a potential relationship between the researcher and the NPs interviewed. I may have taught a participant through the NP education program, or known them through the establishment of the first NPLC or through NP employment. In order to mitigate any issues that a previous professional relationship may have precipitated, the potential NP interview participants were given the opportunity to contact my PhD supervisor or Ethics Officer at Laurentian University confidentially to discuss concerns about participation. The participants would have been given the option to be interviewed anonymously by a third party, such as a research assistant. None of the NPs contacted my supervisor or the Ethics Officer and I conducted all interviews.

NPs were provided with an information package that included a cover letter with an explanation of the interview process, an informed consent form and the semi-structured interview questions (included in the article). Interviews were approximately one hour in duration with shortest being 28 minutes and the longest 64 minutes. The interviewer took notes during the interviews. Each interview was audiotaped and transcribed in its entirety by a research assistant, using the process described in Creswell (2013). Transcripts were double-checked for accuracy against the taped file as well as the interview notes.

5.1.2 Additional Detail Regarding Data Analysis for Article #1

In interpretive descriptive (ID) "data collection and analysis inform one another iteratively" (Thorne et al., 2004, p. 5)." Memos were created during the data collection process and a summary of each interview was created. These documents informed the data analysis process (Hunt, 2009; Thorne, 2008). The documents also served as the basis for reflexivity and personal reflection during the data collection and analysis (Hunt, 2009; Thorne, 2008).

Each interview was analyzed as soon as transcripts were prepared. The transcripts were read and re-read, notes were made and important statements were highlighted. Insights from early interviews were incorporated into the following interviews. A list of prompts is provided in the table with semi structured questions. This allowed for "a responsive interaction between data analysis and data making" (Hunt, 2009, p. 1287).

Insights were coded and categorized. Linkages in the data were identified and relationships and patterns in the data were explored. Preliminary interpretations were confirmed in later interviews. The final analysis is a 'scaffolding' of initial descriptive coding to more sophisticated categories, themes and interpretations (Hunt, 2009; Thorne, 2008; Sandelowski & Barroso, 2003). All eight participants were given the opportunity to review and provide commentary on preliminary analysis. Two participants responded indicating that they felt the themes reflected their experience at the NPLC and no edits were requested.

ID often involves data collection from a number of sources, which is completed in order to ensure that the analysis of interviews is not overly emphasized (Thorne et al., 2004). In this respect, the development of the themes derived from the interviews was supported with research related to professional growth and with grey literature such as reports, briefs and media releases.

5.1.3 Additional Detail Regarding Rigor for Article #1

A review of interpretive description identifies that "ID establishes criteria for assessing rigor" (Hunt, 2009, p. 1288). The research began with a frame of reference for the study of quality in health care, the Donabedian framework, which provided a general view of systems and processes in the NPLCs. Review of the CCM provided additional clinical context to the organizational processes related to chronic care and patients with complex clinical presentations. A detailed account of the iterative data collection and analysis techniques ensured auditability of the data collection process. Confirmation of interpretation of transcripts from participants and available documentation enhanced the credibility and fittingness of the analysis (Hunt, 2009; Thorne, 1997; Lobiondo & Woods, 2009; Thorne et al., 2004).

5.1.3.1 Triangulation of Themes for NP Interview Analysis

Thorne (2008) identifies that documents can be important collateral data in the interpretive methodology. When used to support analysis, documents offer a range of subjective and objective knowledge that can be helpful in mitigating bias and confirming themes. Documents include such things as reports, health policies, media, autobiographies, secondary datasets and more.

One part of data collection for the multiple case study included a search for documentation related to the NPLC model, models of primary health care and NP regulation and practice. The results included research articles, academic reports, reports and website data from professional organizations, government reports (MOHLTC) and regulations, documentation from the College of Nurses of Ontario, reports and website information from NPLCs in the study and articles and other media releases. Document data were collected throughout the completion of this research, from 2012 to 2018.

Data from documents were used to support findings and discussion for NP interviews, chart audit and multiple case analysis. With respect to the NP interviews, as themes emerged, documentation data were used to confirm the final themes. For the theme of vulnerability, some key documents included the following:

Donald, F., Martin-Misener, R., Bryant-Lukosius, D., Kilpatrick, K., Kaasalainen, S., Carter, N., et al. (2010). The primary health care nurse practitioner role in Canada. *Nursing Leadership*, 23 Spec No 2010, 88–113. doi:10.12927/cjnl.2013.22271

Haydt, S. (2017). Politics and professions: Interdisciplinary team models and their implications for health equity in Ontario. *International Journal of Health Services*, 0(0), 1-26. doi:10.1177/0020731417717384

Virani, T. (2012). Interprofessional collaborative teams. *Canadian Health Services Research Foundation*, 1–142.

In the Interprofessional Team Functioning, helpful documents included:

Canadian Health Sciences Research Foundation. (2012). *Evidence synthesis for effective interprofessional teams in primary care*. Retrieved March 8, 2018 from https://www.cna-aiic.ca/~/media/cna/files/en/synthesisinterprofteams_jacobson-en-web.pdf

Conference Board of Canada. (2012a). Briefing 1. Current knowledge about interprofessional teams in Canada.

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Heale, R., Dickieson, P, Carter, L & Wenghofer, E. (2013). Nurse practitioners' perceptions of interprofessional team functioning with implications for nursing managers. *Journal of Nursing Management*, doi: 10.1111/jonm.12054.

Tetley, A., Heydon, A., & Agnew, T. (2016, March 2). Minister Hoskins commits $85 million over three years to interprofessional primary care. *NP News and Media*. Retrieved March 8, 2018 from https://npao.org/minister-hoskins-commits-85-million-over-three-years-to-interprofessional-primary-care/

Virani, T. (2012). Interprofessional collaborative teams. *Canadian Health Services Research Foundation*, 1–142.

Finally, for the Coordination of Care theme, documents that supported the theme included:

Russell, G. M., Dahrouge, S., Hogg, W., Geneau, R., Muldoon, L., & Tuna, M. (2009). Managing chronic disease in Ontario primary care: The impact of organizational factors. *The Annals of Family Medicine*, 7(4), 309–318. doi:10.1370/afm.982

Russell, G., Dahrouge, S., Tuna, M., Hogg, W., Geneau, R., & Gebremichael, G. (2010). Getting it all done. Organizational factors linked with comprehensive primary care. *Family Practice*, 27(5), 535–541. doi:10.1093/fampra/cmq037

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5.2 Article #1: Manuscript

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Nurse Practitioner's Perceptions of the Impact of the Nurse Practitioner-Led Clinic Model on the Quality of Care of Complex Patients

5.2.1 Abstract

Aim: To evaluate the organizational processes that influence the quality of care for patients with multimorbidity at Nurse Practitioner-Led Clinics (NPLCs).

Background: People are living longer, most with one or more chronic diseases (multimorbidity) and primary health care for these patients has become increasingly complex. One response was the establishment of new models of primary health care. NPLCs are an example of a model developed in Ontario, Canada, which feature nurse practitioners as the primary care providers practicing within an interprofessional team. Evaluation of the extent to which the processes within NPLC model addressed the needs of patients with multimorbidity is warranted.

Methods: Eight nurse practitioners were interviewed to determine their perception of the quality of care provided to patients with multimorbidity at NPLCs. Interpretive description guided the analysis and themes were identified.

Findings: Three themes arose from the analysis, each of which has an impact on the quality of care. The level of patient vulnerability at the NPLCs was high resulting in the need to address social and financial issues before the care of chronic conditions. Dynamics within the interprofessional team impacted the quality of patient care, including NP recruitment and retention, leaves of absence and turnover in staff at the NPLCs had an effect on interprofessional team functioning and patient care. Finally, coordination of care at the NPLCs, such as length of appointments, determined the extent to which attention was given to individual clinical issues was a factor. Strategies to address social determinants of health and for recruitment and retention of NPs is essential for improved quality of care. Comprehensive orientation to the interprofessional team as well as flexibility in care processes may also have positive effects on the quality of care of patients with complex clinical issues.

Key words: nurse practitioner-led clinic; nurse practitioner; social determinants of health, patient vulnerability; recruitment and retention

5.2.2 Introduction

There is a global trend of people living longer, however, doing so while managing one or more chronic conditions (WHO, 2014). Having multiple chronic conditions, or multimorbidity, is complex and challenging for both the patient and their health care providers (Bower et al., 2011; Wallace, Salisbury, Guthrie, Lewis Fahey & Smith, 2015). Traditional family practices have struggled to meet all the health care needs of this growing group of patients. In Canada, one response to these challenges is primary health care reform, which includes a shift from solo family doctor practices to the development of new models of primary health care.

Primary health care organizational structures and processes have been shown to influence the quality of the health care patients receive, as well as health outcomes (Campbell, Reeves, Kontopantelis, Sibbald & Roland, 2009; Kiran, Victor, Kopp, Shah & Glazier, 2014). Factors within an organization, such as communication processes and teamwork, as well as community partnerships and patient readiness, all have an impact on patient health outcomes (Russell, Dahourge, Hogg, Geneau, Muldoon & Tuna, 2010).

One new model of primary health care in Ontario is the NPLC. NPLCs were established in areas where there were large numbers of people without access to family practices. The model is unique in that NPs are the primary care providers rather than physicians with an NP clinic lead. Patients register at the clinics and are assigned to a primary NP who works with an interprofessional team to provide comprehensive care (Virani, 2012). Additional team members include physicians, who act as primary care consultants and a mix of RNs, RPNs, social workers and dieticians (Virani, 2012). The NPs at these NPLCs struggle with the same patient care issues

as in other family practice settings, most notably chronic disease management in the care of patients with multimorbidity (Virani, 2012).

It is important to evaluate the quality of care in new models of primary health care, particularly for patients with the most complex health concerns. Donabedian (2003) developed a framework for the evaluation of quality of care in health care systems. When considering organizations, the first two components of this framework are relevant. Structures, the conditions in which care is provided, or the way that health care is set up, including material and human resources and organizational characteristics, is the first component. The second is process, which refers to the activities that constitute health care such as diagnosis, treatment, patient education and 'clinical efficiency'. An analysis of each component as well as the interplay between them provides insight into the quality of care within an organization.

Given the unique care processes at the NPLCs the quality of care for patients with multimorbidity within the NPLC model should be considered. Nurse practitioners practicing in the NPLCs can offer insights into the structures and processes specific to the model and their influence on care of patients with multimorbidity. The research question guiding this study was: *"How do nurse practitioners at NPLCs evaluate the impact of the NPLC model on the quality of the care they provide to patients with diabetes and multimorbidity?"* An additional goal of this study was to identify potential gaps, or issues in health care delivery at NPLCs for further inquiry.

5.2.3 Methods

This was a qualitative study that used the interpretive description methodology. NPs practicing at NPLCs were interviewed. The purpose of the interviews was to obtain a more in-depth

understanding about the impact of organizational characteristics on NP's care for diabetic patients with multimorbidity. A set of questions was developed to help guide the interviews and reflect on the barriers and supports in the care of patients with diabetes and multimorbidity, including the impact of the organizational features of the NPLC model in practice (see Table 4–1). Participants were sent the questions ahead of time along with a description of the purpose of the study.

Analysis commenced at the end of each individual interview. Some tentative codes and themes emerged early in the process (Thorne, 2008). In subsequent interviews, the NPs were prompted to provide more detail or discussion related to an emerging theme. Prompts related to emerging themes were fluid and used in one, or more questions, depending on the direction of the discussion.

Table 5.1: Semi-Structured NP Interview Questions with Prompts

1. What are the barriers in caring for patients with diabetes and multimorbidity?
   Prompt (vulnerability): *Are there any patient characteristics that impact the ability for you to provide care?*
   Prompt (interprofessional team functioning): *What role does the team play in your ability to care for complex patients?*
2. What assists you in caring for patients with diabetes and multimorbidity?
   Prompt (interprofessional team functioning): *What role does the team play in your ability to care for complex patients?*
3. How does the NPLC influence the care you provide to diabetic patients with multimorbidity?
   Prompt (coordination of care): *Are there policies or practices within the NPLC that impact the care you provide?*
4. What would enhance your care of diabetic patients with multimorbidity?
   Any of the previous prompts could be used in this question

NPs were recruited to participate in a telephone interview from five NPLCs located in the mid-northern area of the province of Ontario, Canada. NPs from four NPLCs agreed to participate. The NPLCs were located in urban (2) and rural settings (2), but were chosen for their similarity

and in being traditionally underserved areas with high numbers of patients who had no access to primary health care services (MOHLTC, 2010). NPs were eligible for interview if they worked either part or full time at one of the NPLCs in the study. The NPs were emailed an invitation to participate in an audio-recorded telephone interview along with a draft of semi-structured questions. They were given the option to be interviewed anonymously by a third party should they have felt uncomfortable with the interviewer for any reason, however, none of the NPs chose this option. Eight NPs replied to the email invitation with interest in participation after which they were sent a consent form to sign and a date and time for the interview was set. Interviews were conducted from December 2014 until December 2015. All interviews were conducted by telephone and were approximately one hour in duration. Each interview was audiotaped and transcribed in its entirety by a research assistant and checked for accuracy by the primary researcher (Creswell, 2013). The Laurentian University Research Ethics Board gave ethical approval for the study.

5.2.3.2 Data Analysis

The interviews were completed and analyzed in the interpretive description tradition (Thorne, 2008). Memos were created during each interview and a summary developed. These documents also served as the basis for reflexivity during the data collection and analysis. Each interview was analyzed as soon as transcripts were prepared. The transcripts were read and re-read, notes were made and important statements were highlighted. Insights from early interviews were incorporated into subsequent interviews. Establishment of an audit trail through the compilation of the research protocol, documents reviewed, correspondence, memos and summaries of interviews enhanced the trustworthiness of the data gathering technique utilized in this study (LoBiondo-Wood, Haber & Singh, 2009).

In keeping with the interpretive description, multiple sources were used to support the final themes (Thorne, 2008). This strategy of triangulation, of cross-checking and verification of themes with other sources, confirmed the credibility of the final themes (LoBiondo-Wood, Haber & Singh, 2009). Other sources of data included such things as research about NPs confirming that practice often occurred with vulnerable populations and reports from the Nurse Practitioners' Association of Ontario confirming the lack of increase in remuneration for over 10 years. Participants were given the opportunity to review and provide commentary on preliminary analysis. Two participants responded and no edits were requested.

5.2.4 Findings

The interviews detailed NP's perceptions of their practices at NPLCs. Themes were developed which offer insight into the impact of the NPLC model in the quality of care of patients with multimorbidity.

5.2.4.1 Patient Vulnerability

The NPs described how the patient demographics and the resources available to them at the NPLCs influenced the development of therapeutic relationships and the care that was provided. Since the NPLCs were established in areas with few primary health care services it is not surprising that many patients who registered in the NPLCs had not had consistent primary health care for years. They often had uncontrolled, or undiagnosed chronic conditions. The NPs identified that this resulted in lack of knowledge and understanding of medical conditions with many patients who became overwhelmed with the complexity of their treatment plans and the relationship of their various conditions.

The NPs identified the vulnerability of the patients at the NPLCs. In health care, vulnerability commonly seen as a patient's reduced ability to protect themselves from harm; an obstacle to flourishing (Gjengedal et al., 2013). Those who are vulnerable often have lower levels of education, higher stress, lower income and social exclusion (Braveman & Gottlieb, 2014). Vulnerable patients continue to have difficulties maintaining a healthy lifestyle and have worse health outcomes (HQO, 2012).

In the NPLCs, the NPs found that a higher level of care was required for some conditions than others, which patients found daunting. For example, diabetes care requires medications and lifestyle changes plus ongoing monitoring (Canadian Diabetes Association, 2013) while many other conditions require mostly pharmacological treatment. Patients were sometimes fearful of some of the treatment options, such as insulin injections.

The NPs adapted their practices recognizing the pressures patients are under and working toward optimal therapeutic relationships.

> I think the important thing to remember with these people with chronic diseases is to try to get them in here regularly but to be very non-judgmental about the things they don't want to change in their life. (NP2)

The NPs also identified that many patients lack the financial and social supports required to implement the treatment plans for their conditions. Patients were not always able to afford medication, devices or even appropriate food.

> It is the finances. A lot of the patients that we have here don't necessarily have the resources to pay for their supplies. (NP4)

Mental health issues, such as depression, were often linked to lack of social supports and were seen as further examples of vulnerability and an additional barrier to self-care of multiple chronic conditions. This situation was often exacerbated when patients lived in areas without public

transportation and community services and had to rely on family and friends for assistance for things like completing diagnostic tests. Hidden costs of attending community services were also identified.

> A lot of them don't have access to transportation just because we don't have a public bus system, or taxi service in the area so they either rely on family, friends, when they can…It impacts what I can do as a provider or what I can recommend. (NP6)

> And for some it's as simple as they have to pay for parking at the Diabetes Education Centre. And they don't here (the NPLC), so there are barriers to using some of the community resources. (NP8)

The NPs indicated that urgent social and economic issues took priority over the management of the patient's multiple chronic illnesses, which negatively impacted the quality of care of these conditions.

5.2.4.2 Interprofessional Team Functioning

The NPs identified benefits to the interprofessional team approach within the NPLC model. They value their ability to work autonomously with their own panel of patients within the interprofessional team.

> Even just the co-workers, we bounce ideas off of each other. So it is very supportive but at the same time we have, each of us have our own freedom to - we each manage things in different ways, right. (NP1)

The NPs identified that utilizing the skill mix of the team and giving the opportunity for each team member to work to their full scope of practice can result in fewer community referrals and less disruption of care to patients during times of staff turnover or vacancies. For example, the NPLC dietician may be able to provide counseling about diabetes self-care in lieu of referral to a Diabetic Education Centre, or the social worker may be able to provide counseling to patients.

> NPLC is very grateful to have a social worker on hand. Because we're in a rural community I find that there's a lot of undiagnosed mental health. Or even just to learn how to cope with the new diagnosis, it comes very handy. (NP6)

> Definitely having the multidisciplinary team that we have access to. The dietician, pharmacist and even times a social worker is a benefit if we have an older frail individual in the community that needs support etc. (NP1)

Many patients are not accustomed to working with an interprofessional team, which has created some barriers to engagement of team members other than the primary NP.

> Some of them (patients) are very resistant, but for those who we've convinced to try one visit have been continuing. It definitely works and helps. (NP6)

> Although a lot of patients are attached to their primary care NP it's often for the benefit of the patient to see the other professional as well. (NP7)

> And it also depends on what the client wants. So if we have a diabetic, overweight, hypertension patient we would offer to - please see the dietician, see our nurse for blood pressure checks. We do have an RPN here who does blood work. So it all depends on what the client is willing to do. So at the bare minimum they'll usually just see the NP but if they're agreeable, we're definitely hoping they'll see other members. (NP1)

NPs discussed the level of functioning of the team members and the impact on care. In cases where team members' expertise is utilized to the fullest, and they are easily accessible, the NPs describe better care delivery. They described the need for clarity of roles and responsibilities and the need to adapt practice to the specific professional relationships among team members:

> We're looking at our end and getting them (RNs, dieticians) to work to full scope…if they can do some of the simple little things. If we have a diabetic, they automatically go to the nurse, ideally. It takes the burden off the NP. (NP3)

> It definitely depends on whichever physician you have working in the clinic. They have their own differences in how they practice. (NP1)

Even within the NP group, it's necessary to negotiate and understand other's roles.

> Yes (will do home visits). But it also depends on each practitioner because there's some that don't really feel that that's part of their role or they might not want to. So that's their decision. Each NP may or may not but our social worker does do it, our RPN and our RN will. (NP1)

Skill level, confidence in caring for patients with complex clinical issues, knowing the limit of their knowledge and when to refer, or consult are some factors that were identified. The team

offered benefit in that NPs were able to tap into the expertise of the other members of the team as they matured in the role of primary caregiver.

> Another thing that assists me in caring is my interdisciplinary team so working with different RNs or different scopes of practice, other NPs just bouncing ideas sometimes is wonderful. My consulting physician. Those are all aspects. Sometimes I can only do so much and I just kinda block so I can use my consulting physician to pick her ideas and see if I'm missing something. That definitely helps that we have that availability. (NP5)

The interprofessional team functioning is further influenced by changes in team members. The NPs indicated that each of the NPLCs in the study had experienced turnover, or leaves of absence since opening, which impacted the team dynamics. There were changes in the physician collaborators at several sites as well as with other members of the health care team. When members of the team with specific expertise leave the clinic, gaps in care arise, which can impact quality of care.

Most of the NPs indicated that there had been gaps in the NP complement while they had been at the NPLC either from unfilled positions, attrition and maternity or sick leaves. The turnover of NPs in the NPLCs and/or unfilled positions has led to sudden shifting of the remaining NPs' patient caseload to another NP who is not as familiar with the individual patients and their plan of care. Learning the details about a number of complex patients with multiple chronic conditions is time consuming for the NPs who remain at the clinic. Patient access to care is reduced as the NPs have to include these additional patients to their workload.

> Provider turnover, maternity leave, definitely impacts how we provide care because we have to adapt…and we still have to function to provide primary care. (NP4)

Many of the NPs felt overwhelmed with the complexity of the care of patients with multimorbidity, coupled with the additional demands of unfilled positions and NP turnover.

> So that becomes a little bit more complicated for me. Like, what about the medications, and not having a pharmacist here anymore to help do some of those medication reviews. (NP5)

5.2.4.3 Coordination of Care

NPLC organizational approaches to patient access to clinic services have an impact on their care. The NPs all indicated that their booking system had some 'same day' appointment times and some had formally implemented scheduling processes to achieve this. Also, the nature of appointments with the NP at the NPLC also impacts patient care. NPs who were able to determine appointment length and frequency of appointments for each patient indicated that they were able to address many concerns per visit and that their patients had better medical control of their conditions.

> I think that's done individually with patients so the patients we see monthly because they need that extra support or we're trying to figure out their insulin. And other people it's every three months, so I'd say it's a bit more individualized. (NP8)

> We have a little bit more luxury in time. We can seek and schedule longer appointments that your routine clinics I say. I don't schedule my patients 15 minutes. I schedule chronic disease management for 30 minutes. I talk to them about the regularity of coming in. Ultimately it's their decision to come in every 3-4 months, but I do recommend that they follow that schedule…it's to check in on their goal setting and attainment. (NP7)

However, some NPs had limitations imposed by NPLC policies on their ability to determine length of appointments, number of patients seen per day and amount of time for administrative duties, which has led to some feeling overwhelmed.

> Another thing that would enhance (care of patients with multimorbidity) obviously would be prioritizing my scheduling and my day or just in regards to my admin time, clinical time, all of that need. Every week I look at my weekly schedule and review. To not be afraid to say I'm feeling overwhelmed and giving myself more admin time. (NP2)

In some NPLCs, patients may be seen by someone other than their primary NP, or switched to a different primary NP when there is staff turnover. Thus, continuity of care can suffer.

> … sometimes they (patients) will see different providers if someone's away on vacation and it impacts them because they're not getting the same message.

> Everyone works differently, and that's ok, but I find that it does create a barrier for them. (NP6)

Finally, NPs were able to implement innovative strategies for patient engagement, which they see as a benefit of the NPLC model. This included programs such as telephone follow-up or group medical visits.

> So the NPLC model in terms of chronic disease management, certainly we follow basic guidelines for all conditions, but on top of that we look at innovative ways of assisting patients to meet their goals and stay on target. (NP7)

5.2.5 Discussion

This study highlights some of the key issues impacting the care of patients with multimorbidity at NPLCs. Although the NPLC model is unique, the themes arising offer insight into the impact of the organization of the NPLC model on quality of care of patients, larger issues facing primary health care across the globe, as well as some key areas for continued research.

Delivery of care in the NPLC model is negatively influenced by the inability of the NPs to adequately address their patient's socioeconomic problems. The most urgent patient concerns may arise from the social determinants of health including employment (finances) and social isolation (Braveman & Gottlieb, 2014), rather than to manage chronic conditions.

NPs have a long history of working with high patient vulnerability. In fact, a key feature of the NP role in Canada has been "…the intake of vulnerable patients that say they are dealing with a chronic condition" (Donald et al., 2010, p. 95). Typical characteristics of NP patients were not taken into account in the development of the NPLCs resulting in a lack of recognition of the impact of the social determinants on the ability to deliver quality care. The NPLC budget provided by the Ontario MOHLTC, does not allow any flexibility in the budget lines and does not include community development funding (personal communication, Jennifer Clement, Clinic Director,

Sudbury District Nurse Practitioner Clinics, June 2017). Without a formal connection to the patients in their living environment, such as a community outreach program, there is no mechanism for the NPs to address the patient's socioeconomic concerns so that they can then focus on their medical conditions.

In addition to a lack of NPLC processes to assist with care of vulnerable patients, the NPs find it difficult to address their medical complexity. NP education focuses on medical diagnoses and appropriate processes for health promotion and disease prevention in primary health care. CPGs are condition-specific (e.g., diabetes and COPD) (Wyatt et al., 2014). There are no guides that reflect socioeconomic realities and their impact on patient care. Patient care in NPLCs is delivered within the structures and confines of 'medical' primary health care and clinic budget and policies. The NPs have difficulty adjusting to this role and maintaining wholistic care, addressing the social determinants, in the face of these constraints.

The WHO (2010) has identified this situation globally and defines it as selective primary health care, where health policy and resources of a jurisdiction are on targeted interventions rather than focused on broader strategies to address the actual sources of morbidity and mortality, including socioeconomic disadvantage. Policy development to allow for better integration of health care with social supports is a first step. This will be different for each jurisdiction, however, in Ontario, it could mean something as simple as a community case worker who is embedded in both the ministry of health, as well as the ministry of social services. Within the NPLCs themselves, resources should be allotted to develop programs and partnerships which reach out to community more effectively to develop such things as transportation programs to appointments and accessibility to prescriptions.

Flexible organizational processes from a provider and organizational perspective, may be helpful in enhancing the care of patients with multimorbidity at NPLCs. NPs expressed feeling overwhelmed with the complexity of the care of patients, in particular as they are the primary care providers. This is exacerbated with multimorbidity and the demands of assuming another NP's patient load. Benner (1984) identified that organizational support structures may be a necessary component to the career development of nurses and may also be the same for NPs. A helpful strategy to mitigate being overwhelmed may be the ability of the NP to slow down patient appointments and add administrative time and additional support when the caseload changes are made.

Difficulties in NP recruitment and retention reflects an international health human resource crisis (OECD, 2016). This concern in NPLCs is threaded throughout all of the themes and has an overarching impact on the quality of care of patients with multimorbidity at the NPLCs. The effectiveness of NP practice is reduced as NPs struggle to establish a therapeutic relationship with, and readjust to the technical aspects of the care of each new complex patient they have added to their roster (Donabedian, 2003). Repercussions of staff turnover are also felt in the level of functioning of the interprofessional team.

There has been very little research into the efficacy of recruitment and retention strategies for NPs, particularly focused on rural settings. However, it is well known through strategies related to physicians that the community itself, including housing, education, and recreational opportunities, plays a large role (Felix, Shepherd & Stewart, 2003). Additionally, financial incentives have been routinely implemented to maintain the primary care physician workforce (OECD, 2016). In April 2017 NPs received their first increase in salary in 10 years (Tetley,

Heydon & Agnew, 2016). The impact of this on recruitment and retention of NPs in NPLCs has yet to be determined.

Policies to ensure consistent increases in remuneration of NPs in NPLCs as well as the delivery of other community-based incentives is an essential consideration to maintain a stability in human health resources in the NPLCs. NPs themselves have a role to play. Advocating for health equity for the patients at NPLCs and for fair and equitable remuneration is a necessary element to NP practice in Ontario, which is often this is best achieved through participation in professional organizations such as the NPAO (Haydt, 2017).

5.2.6 Conclusion

This study sought to determine how nurse practitioners at NPLCs evaluated the impact of the NPLC model on the quality of the care they provide to patients with multimorbidity. NPs identified a number of benefits and challenges in the care of patients with multimorbidity in NPLCs. Certainly a significant benefit is an increased access of patients to comprehensive primary health care services (Virani, 2012). That alone is confirmation of the value of the NPLC model. However, patient vulnerability and the NP turnover pose barriers to quality of care for patients with multiple chronic conditions. A review of the complexity of patients in NPLCs, along with environmental scan of the resources available (e.g., lab draws), may be used to ensure that adequate funding is available to clinics with large numbers of vulnerable patients.

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Chapter 6

6 Article #2: Chart Audits

6.1 Preface to Article #2

Chart audits provide analysis of data from a quantitative perspective and are an excellent measure of primary care clinic data (Liddy, Weins & Hogg, 2011). This type of data has the advantage of not relying on participant recall and, therefore, helps to avoid bias. Conducting a chart audit allowed for standardized collection of data from all the NPLC sites in the multiple case study. While patient health outcomes were not part of this study, an exploration of the processes of care within the NPLCs for patients with diabetes and multimorbidity helped to identify the level of quality of care that is delivered in this model.

6.2 Article #2: Manuscript

Heale, R., Wenghofer, E., James, S. & Garceau, M. L. (2017). Quality of care of patients with diabetes and multimorbidity registered at nurse practitioner-led clinics. *Canadian Journal of Nursing Research*. doi:10.1177/0844562117744137

Note: This article has been edited after publication for the requirements of this PhD program and does not appear exactly as in the journal.

Quality of Care of Patients with Diabetes and Multimorbidity Registered at Nurse Practitioner-Led Clinics

6.2.1 Abstract

Background: Nurse Practitioner-Led Clinics (NPLCs) are a new model of primary health care in Ontario. NPLCs are distinctive in that NPs are the primary care providers, working with an interprofessional team. There have been no studies of the quality of care within the NPLC model.

Purpose: Research of the NPLC model, specifically for complex clinical presentations, will provide insights that may be used to inform improvements to the delivery of care in the NPLCs. The aim of this study was to evaluate the extent to which diabetes care was complete and to determine the impact of organizational tools including EMR tracking, diabetes care template and

referral to community programs, on the completeness of care of patients with diabetes and multimorbidity at NPLCs.

Methods: An audit of 30 charts was conducted at 5 different NPLCs (n=150) for patients with diabetes and at least one other chronic condition. Indicators included patient and organizational characteristics as well as diabetes care items taken from diabetes clinical guidelines.

Results: Overall, care for patients with diabetes and multimorbidity in NPLCs was complete. However, there were no significant associations between patient or organizational characteristics and the extent to which diabetes care was complete.

Conclusions: The impact of organizational characteristics in the care of complex patients at NPLCs is worthy of attention. Future studies should be undertaken to explore patient health outcomes related to the delivery of care in NPLCs.

6.2.2 Background and Purpose

NPs across Canada have struggled not only to expand their legislated scope of practice, but to also carve out a niche in the health care system. Plagued by legislative and system barriers, NPs have lobbied continuously for policy changes that better support NP practice and improve patient care (DiCenso, Bryant-Lukosius, Bourgeault & Treloar, 2010). Fifty years of history demonstrates the leverages and barriers to NP practice in Canada (Edwards, Rowan & Grinspun, 2011).

The NPLC model in Ontario was born from these struggles. The term Nurse Practitioner-Led Clinic was coined by the MOHLTC in Ontario, specific to this model of primary health care in Ontario. The first was established in 2007, primarily to alleviate a gap in access to primary health care services. This was followed by the establishment of an additional 25 NPLCs developed across Ontario (MOHLTC, 2015). Key features of the NPLCs are that the clinics are independently incorporated and include patient registration to the clinic and not to an individual provider (Heale, 2012). The NPLC model is unique in that NPs are the primary care providers and have overall accountability for their patients. However the NPs work within an interprofessional team which includes RNs and/or RPNs, social workers, dieticians and physicians (Heale, 2012). This

organizational structure promoted the reduction of NP practice barriers by allowing the NP to work to the full scope of practice. Within the NPLCs, there was an expectation for the same comprehensive, evidence-based family health care services that other models provide (Virani, 2012).

NPLCs have other organizational characteristics. Located in underserviced areas, many of the patients that are registered at NPLCs have not had access to primary health care for long periods of time, up to years (Heale, 2012; Virani, 2012). NPLCs have EMR rather than paper charts (Association of Family Health Teams of Ontario, 2016). EMRs include features such as the ability to highlight areas to follow up with patient issues and communicate among health care providers through electronic tracking features. In addition, EMRs often include specific sections with templates for care, such as a diabetes care template (Stellefson, Dipnarine & Stopka, 2013).

Despite advancements in primary health care such as the introduction of electronic communication tools, there are many barriers to the successful implementation of a model of primary health care. Studies of other primary health care models in Ontario have confirmed that organizational structural components such as governance, human resources, office infrastructure, access, patient-provider relationship and continuity of care all have an impact on the quality of care (Dahrouge et al., 2009; Russell, Dahrouge, Tuna, Hogg, Geneau & Gebremichael, 2010). In addition, there are also implementation factors that promote successful outcomes of the model of care, such as the effectiveness of the interprofessional team (Russell et al., 2010). Successful implementation of high quality care within the primary health care organization includes the "use of evidence-based practices in providing programs and services" (Virani, 2012, p. 17). Collaboration and partnerships within and external to the organization, as well as with the patient, are also important features of successful implementation (Virani, 2012).

One measure of the success of a model of primary health care is the extent to which health care providers within an organization are able to address complex health issues. Organizational structures can impact the quality of care for patients with high clinical complexity. Many chronic diseases, such as diabetes, that are managed routinely in primary health care settings are very complex (Agarwal, Kaczorowski & Hanna, 2012; CDA, 2013; Harris et al., 2006) and health care providers often have difficulty in implementing CPGs, or best practice, especially when patients have multiple chronic diseases, or multimorbidity (CDA, 2013; Fortin, Soubhi, Hudon, Bayliss & Akker, 2007; Harris et al., 2006). Along with barriers such as time constraints, patient self-care that conflicts with guidelines and issues in the coordination of care, clinical guidelines that only consider one condition and give limited consideration of multiple concurrent conditions and the interactions between them are a barrier to the implementation of clinical guidelines (Bower et al., 2011; Fortin et al., 2007; Smith, O'Kelly & O'Dowd, 2010).

Research shows the value of NP care in specific settings, such as in hospital (Hurlock-Chorostecki, Forchuck, Orchard, Reeves & van Soeren, 2013). NPs also have proven value in primary health care. For example, a case analysis was of the effectiveness of shared medical appointments three in NP-led, multidisciplinary chronic disease management programs for diabetes, hypertension and heart failure, in US clinics was conducted. Cases were evaluated using the elements of the Chronic Care Model and results indicate that (Watts et al., 2009). The NPLCs are different in that they are a model of comprehensive primary health care, much like a community health centre, but with NPs as primary care providers and interprofessional team leaders (Heale, 2012). There has been no research into the model itself, in particular an exploration of organizational factors and the quality of care of complex clinical presentations. To that end a study was undertaken of the NPLC model.

A chart audit was conducted in five NPLCs utilizing a tool that reflected internal organizational processes along with external links. The purpose was to determine the comprehensiveness of care for patients with diabetes and multimorbidity in NPLCs through evaluation of the completeness of the care items identified in the clinical practice guideline for diabetes (CDA, 2013). This included a review of the extent to which care items from the diabetes CPGs were met and the influence of organizational factors on that care.

6.2.2.1 Framework

The Donabedian (2003) quality framework (Structure-Process-Outcome) is useful in studying quality in health care. The components of structure and process help to define the characteristics of, and interactions between, organizational features and health care system and provide a guide to the study of NPLCs. Structure is the way that health care is set up including material and human resources as well as organizational characteristics. There is often a disconnect between these components in the delivery of health care, such as between primary health care organizations and community programs directed to patient support for self-care (Zhang, Van Leuven & Neidlinger, 2012). Process refers to the activities that constitute health care such as diagnosis, treatment, patient education and patient involvement (Donabedian, 2003). Processes within primary health care clinic environments impact the quality of care of patients with complex medical histories. Patients with multimorbidities are more difficult to treat than patients with only one chronic condition (Fortin et al., 2007), so a review of processes in the care of these patients is helpful in providing insight on organizational effectiveness. The implication is that appropriate and effective structure and processes will result in higher quality of care and better patient health outcomes.

6.2.3 Methods and Procedures

6.2.3.1 Chart Audit Tool

A chart audit tool was designed to capture the organizational (structural) and patient characteristics within the NPLC model. The Chronic Care Model (CCM) was used to identify and define specific items included in the NPLC chart audit tool. The CCM was chosen because it is divided into categories that reflect the structure and processes elements within Donabedian's Quality Framework by specifically defining internal processes and external links identified as requirements of the NPLC model (Virani, 2012). The CCM categories used to guide the development of items for the NPLC chart audit are Community, Patient, Clinical Information Systems, and Decision Supports.

Community items represent links external to the clinic and reflect the structure element of the Donabedian framework, through the NPLC links to the wider health system. The item in this category included whether patients attended a community resource, such as a diabetes education group.

The remainder of the chart audit items reflect processes within the NPLCs. **Patient** specific items in the chart audit tool included demographic data (age and sex), length of time registered in the clinic and the number of chronic diseases. **Delivery System Design** refers to practice systems including appointments and follow up with the patients with chronic disease. Chart audit items for this category included such things as the number of patient clinic and telephone appointments (Stellefson, Dipnarine & Stopka, 2013). **Clinical Information Systems** items were things that demonstrated communication among the NPLC team members, such as use of tracking tools within the EMR (McCurdy, MacKay, Badley, Veinot & Cott, 2008; Wagner, Austin, Davis, Hindmarsh, Schaefer & Bonomi, 2001). **Decision Support** includes the use of evidence-based

guidelines through diabetes templates in the EMR (Grimshaw & Russell, 1993; Stellefson, Dipnarine & Stopka, 2013). Diabetes care templates in EMRs are a section within a chart, where all the important data about the patient's diabetes care can be charted, stored and easily retrieved. In addition to the use of a diabetes care template, the chart audit included a set of nine care items developed from the CDA (2013) Clinical Practice Guidelines and previous studies that are considered essential for optimal care of patients with diabetes in a primary health care setting (Agarwal, Kaczorowski & Hanna, 2012; Canadian Diabetes Association, 2013; Harris et al., 2006). The items are routine lab work (HgA1C, lipid profile, microalbuminurea), blood pressure (BP), eye and foot exams, review of patient eligibility for daily acetylsalicylic acid (ASA), smoking status, and annual flu shot (CDA, 2013). Charts were reviewed to determine whether diabetes care items were completed and documented.

Content validity of the chart audit tool was established through review by the Board of Directors and NP Clinic Leads from each of the five NPLCs in the study (Allison et al., 2000). They reviewed each item and submitted recommendations about the relevance of each for the NPLC context. Based on their feedback, an item was added about missed patient appointments.

Pilot of Instrument. Once ethical approval was obtained from Laurentian University and permission from each of the Board of Directors of the NPLCs, the chart audit tool was tested. The goal was to determine challenges to collecting the data and to establish intra-rater reliability of the chart audit process. The pilot test helped to ensure that it was feasible to collect the data related to each item and there was consistent interpretation of the items in the chart audit. Issues such as eligibility for receipt of care processes, the time frame and lack of documentation for key indicators was reviewed (Allison et al., 2000).

6.2.3.2 Chart Audits

Sample. Seven out of a total 25 NPLCs were approached to participate in the study. Of that, 5 NPLCs participated in the study with 30 charts audited at each, for a total of 150 charts. The NPLCs that were chosen are positioned in the mid-north of Ontario (i.e., specifically located in the jurisdiction of the North East or North Simcoe Muskoka LHINs), in regions with high levels of chronic diseases compared to the rest of the province and with a history of reduced access to comprehensive primary health care (North East LHIN, 2013; North Simcoe Muskoka LHIN, 2013). Patients included in the chart audit were over the age of 18, non-pregnant, registered for at least 12 months with the NPLC and had diabetes mellitus plus one or more other chronic conditions. Chronic diseases, or conditions, were determined using the definition from the WHO that includes conditions that are noncommunicable, of long duration and slow progression (WHO, 2010). The number of chronic conditions was derived from the list of ongoing health conditions in the patient history section of the EMR. Patients with gestational diabetes were excluded from the research study as were patients with whom the primary researcher had ever had a therapeutic relationship.

Random Sample Selection. Each NPLC in the study used an EMR system for charting and storing patient information. A list was created by a staff member of each NPLC of all patients with a diagnosis of diabetes and at least one additional chronic disease in each NPLC. Each patient in the list was assigned a number. A random number generator was used to supply a separate list of numbers for each list of patients at each NPLC. The corresponding charts of the first 30 random numbers chosen in each NPLC were included in the chart audit. All data collected were from the 12-month period prior to the date that the chart audit was completed.

6.2.4 Analysis

Descriptive statistics of all patient data (i.e., age sex, number of chronic diseases and appointment history) and organizational tools (i.e., EMR tracking, chronic disease templates, utilization of community patient health education and support programs) were examined to provide an understanding of the patient population and clinic structures. We specifically examined the frequency of use of organizational tools in those charts where the individual diabetes care items were completed.

A total score for diabetes care items was calculated for each chart. Each of the 9 items were indicated as being present 'yes/no' and coded as yes = 1 and no = 0. For example, if the patient had received an influenza vaccination within the chart audit timeframe, it was given a score of 1. If there was no evidence of an influenza vaccination within the study period, this section was coded as 0. The range of diabetes care scores was 0–9. In order to determine if the NPLCs could be examined as a group, a sensitivity analysis was completed through an ANOVA to determine if there were any significant differences in the mean diabetes care scores between clinics.

A Spearman Correlation was used to determine if there was an association between age, number of chronic diseases and diabetes care scores. A t-test was used to determine patient sex was associated with diabetes care scores.

Chi Square was used to determine any associations between organizational tools (use of EMR tracking, use of diabetes template, referral to community health education program) with each diabetes care item.

6.2.5 Results

The mean patient age was 62 years with a range of 68 years from 23–91. A total of 65 (54.2%) of the patients were female and 55 (45.8%) were male. The number of documented chronic conditions of these patients ranged from 2–14, with a mean of 4.63. Patients had been registered in the clinic a range of 12–83 months with a mean of 31.3 months.

Although the NPLC organizational structure is similar across all NPLCs (e.g., all have EMRs and similar complements of health care providers), the use of organizational tools and resources, including EMR tracking, referral to a community program and completion of templates, varies across clinics.

Table 6.1: Use of Organizational Tools by Each NPLC for 30 Patient Charts

	NPLC 1	**NPLC 2**	**NPLC 3**	**NPLC 4**	**NPLC 5**	**All NPLCs** (n=150)
Completed diabetes templates	1	6	0	0	24	31
EMR tracking used	17	10	18	0	29	76
Referred to a community program	0	1	1	5	0	7

Table 6.2 lists the number of times that a care item was completed for each patient in the chart audit. Items completed in less than 50% of the charts are bolded (eye exam, foot exam, flu shot, ASA).

Table 6.2: Diabetes Care Items Completed for Each Patient in the NPLC Chart Audit (n=150)

Diabetes care item and expected frequency of completion	Yes (evidence of documentation)
HgA1C (every 3 months)	99 (66%)
Albumin/Cr ratio or 24 hour urine (annual)	105 (70%)
Lipid profile (annual)	126 (84%)
BP (annual)	142 (94.7%)
Evidence of retinal eye exam (annual)	**16 (10.7%)**
Complete foot exam (annual)	**29 (19.3%)**
Offered influenza vaccine (annual)	**73 (48.7%)**
Review appropriateness of ASA (any time)	**68 (45.3%)**
Smoking status review (any time)	140 (93.3%)

A one way ANOVA test showed that the there was no statistically significant difference in the mean diabetes care scores between the five clinics ($p = 0.853$).

A Spearman's rank-order correlation was run to assess the relationship between diabetes care scores and patient characteristics. No significant correlation was found between diabetes care scores and age ($rs = 0.63$; $p = 0.445$), number of chronic conditions ($rs = 0.013$; $p = 0.872$), or length of time registered at the clinic ($rs = -0.009$; $p = 0.910$). Additionally, t-test showed that there was no significant difference in the diabetes care scores between men and women ($p = 0.171$).

Chi square tests were conducted to determine if there were any associations between the completion of the individual diabetes care items and organizational processes including EMR tracking, use of a template or referral to a community program. There was only one significant

association, use of EMR tracking and completion of lab work for lipid profile ($X^2 = 4.649$; $p = 0.031$). The chart audit revealed that there is variability in the documentation of routine diabetes care in the NPLCs. Items that related to direct care in the NPLC (BP and lab work) were most commonly documented (see Table 6–2). However, care that was provided external to the clinic, such as the annual eye exam, which is meant to be completed by an optometrist or ophthalmologist (CDA, 2013), and influenza vaccines that are available in pharmacies throughout the province (Ontario Pharmacists Association, 2016), were documented less frequently (see Table 6–2). These two diabetes care items were removed and for those charts where the individual diabetes care items were completed, the frequency with which organizational tools/processes (i.e., EMR tracking, Referral to Community Programs and Completion of a Chronic Disease Template) were examined to determine if there was a difference in the completion of each diabetes care item when an organizational tool/process as used and when it was not.

A difference of greater than 10% was found in in three sections of the three charts (bolded), including lipids and EMR tracking (Table 6–3) and ASA and foot examination and referral to a community program (Table 6–3). There was no pattern, which would suggest that use of the diabetes template, EMR tracking or referral to community programs made no difference in whether the diabetes care items were completed.

Table 6.3: EMR Tracking Use, Referral to Community Program and Use of Completion of Diabetes Templates in NPLC Patient Charts Where Individual Diabetes Care Items Were Completed

Completed Diabetes Care Tasks	EMR Tracking		
	No n (%)	**Yes** n (%)	**Total**
Smoking status review	70 (92.1%)	70 (94.6%)	140
Review appropriateness of ASA	34 (44.7%)	34 (45.9%)	68
Complete foot exam	12 (15.8%)	17 (23.0%)	29
Blood pressure	73 (96.1%)	69 (93.2%)	142
Lipid profile	**59 (77.6%)**	**67 (90.5%)**	126
Albumin/Cr ratio or 24 hour urine	52 (68.4%)	53 (66.2%)	105
HgA1c	50 (65.8%)	49 (66.2%)	99
	Referral to Community Program		
Smoking status review	124 (93.2%)	16 (94.1%)	140
Review appropriateness of ASA	**62 (46.5%)**	**6 (35.3%)**	68
Complete foot exam	**28 (21.1%)**	**1 (5.9%)**	29
Blood pressure	126 (94.5%)	16 (94.1%)	142
Lipid profile	114 (85.7%)	12 (70.6%)	126
Albumin/Cr ratio or 24 hour urine	93 (69.9%)	12 (70.6%)	105
HgA1c	90 (67.7%)	9 (52.9%)	99
	Completion of Diabetes Templates		
Smoking status review	110 (92.4%)	30 (96.8%)	140
Review appropriateness of ASA	53 (44.5%)	15 (48.4%)	68
Complete foot exam	23 (19.3%)	6 (19.4%)	29
Blood pressure	114 (95.8%)	28 (90.3%)	142
Lipid profile	98 (82.4%)	28 (90.3%)	126
Albumin/Cr ratio or 24 hour urine	85 (71.4%)	20 (64.5%)	105
HgA1c	81 (68.1%)	18 (58.1%)	99

6.2.6 Discussion

The main finding of this study is that, overall, the care requirements are complete for patients with diabetes and multimorbidity in NPLCs. The diabetes care items were completed for the majority of patients and there is good reason to assume that two of the items that were poorly

documented in the charts because they are completed (i.e., eye exam), or are readily available (i.e., flu shot), external to the NPLC. Care that is not provided by within the clinic itself is less likely to be documented. The second major finding is that there is variability in the use of organizational tools in the NPLCs, however, this did not make a difference in the completeness of diabetes care for the patients. Finally, with one exception, which appears to be an outlier, no significant associations were found between patient characteristics or organizational tools and the completeness of care.

The findings provided a snapshot of structural features and processes and their impact in the care of patients with diabetes and multimorbidity in NPLCs, however, there are several limitations to the study which may impact the interpretation of the findings. The sample included only five NPLCs so the findings may limit the generalizability of the study to all NPLCs in Ontario. Patient charts, electronic or otherwise, do not capture informal communication or the nature of the communication between patients and providers. In addition it is important to acknowledge that patient charts only represent what has been documented and do not necessarily represent the quality of care provided (Holroyd-Leduc, Lorenzetti, Straus, Sykes & Quan, 2011). The chart audit tool alone does not provide insight as to the reasons why certain associations were found (e.g., there is not enough information to respond to the question as to why use of EMR tracking was significantly associated with completion of lipid lab work and not any other diabetes care items). Future studies could explore specific communication within the EMR tracking and link it to individual diabetes care items in order to examine this more thoroughly. Finally, there was no evaluation of the resources available in the communities where the NPLCs are situated which may also have an impact on the care provided and recommendations made.

Given that the organizational tools did not impact the care of patients with diabetes and multimorbidity in this study, potential recommendations for future research and improved quality of care may be found in exploring possible reasons for the care items that were not completed. To this end, health care structures, including community resources such as accessibility to diagnostic clinics, are worth consideration.

Comprehensive chronic disease management requires a focus on patient self-care and patients' use of community resources to facilitate this is encouraged (Canadian Health Services Research Foundation, 2012). However, in this study only 7 out of 150 patients had been referred to a community program. This may represent a gap in charting, however, it may also reveal issues affecting patient access, or lack of availability of community services. This finding deserves further examination, in particular environmental scans to determine the extent to which community resources are available.

The NPLCs might also benefit from leveraging the unique features of NP practice in the clinic processes. NPs are at an advantage in that they are salaried which allows them to schedule longer appointments in which many problems can be addressed or to incorporate innovative strategies which may have a positive impact on the completion of care items related to chronic disease management (Russell, Dahrouge, Hogg, Geneau, Muldoon & Tuna, 2009). Examples of these unique features include shared appointments with two or more providers at a patient appointment, or group health visits where a group of patients with similar diagnosis attend one appointment where all patients hear the issues of, and advice given, to each patient to improve knowledge and self-care motivation of all (Simmons & Kapustin, 2011).

Another noteworthy area for ongoing research is the presence of multimorbidity and the impact on clinical practice. When presented with several issues at a patient visit, practitioners typically list and prioritize issues across all conditions at each visit. Alternatively, practitioners tend to focus on disease parameters, like HbA1c for diabetics, or simpler, acute problems. They then ignore global patient outcomes related to the interaction among all medical conditions and the patient's socioeconomic status. Thus, complex presentations of symptoms and interactions of treatments for multiple chronic conditions may be overlooked (Bower et al., 2011).

Completion of the annual foot examination for diabetic patients in the NPLC chart audit is a possible example of the prioritization of care. Diabetic foot examinations which include sensory testing and checking for pressure points and sores that do not heal should be conducted annually (CDA, 2013). Only 19.3% of the patients in the chart audit had received an annual foot examination. This care task is more time consuming and complex than many of the others (e.g., BP and lab work) and it may be deferred more often during the prioritization of issues presented at patient appointments. Additionally, care items are often distributed among team members. For example, in most of the NPLCs, a foot care nurse conducts the diabetes examination, not the nurse practitioner. Poor documentation of foot exams may be an issue of role confusion within the NPLC interprofessional team and the nature of interprofessional teamwork within the NPLCs warrants further investigation.

In addition to clinical practice, the impact of patient characteristics with multimorbidity on quality of care should be examined more carefully. Chronic diseases cluster and patients with one chronic disease are more likely to have other chronic conditions (Fortin et al., 2007). In addition, people with lower levels of education and socioeconomic status are more likely to have multiple chronic conditions (Smith, O'Kelly & O'Dowd, 2010), which, in turn, impacts their

ability to manage their conditions and their overall health outcomes. Care processes in primary health care organizations, including NPLCs, do not typically take into consideration the socioeconomic status of the patient, or their experiences with multimorbidity. Rather, much like CPGs that are developed to address one condition at a time, care is most often directed around individual conditions. This is seen in the structure of EMRs, which have templates for individual diseases. Although there are some commonalities among conditions (e.g., heart disease and diabetes), practice tools and clinical care tends to focus on one condition at a time (Bower et al., 2011).

There was a lack of association between the number of chronic conditions the completeness of diabetes care in this study. However, the nature of each of the specific chronic conditions, along with patient characteristics on the patient's quality of life is not known. Future research may be focused on the quality of care in the NPLC model related to the patient's socioeconomic status as well as the relationship of quality with different clusters of medical conditions.

6.2.7 Conclusion

In this study, NPLC organizational processes did not impact the care for patients with diabetes and multimorbidity, yet, overall, care was complete. Further research is required to identify structure or process variables that do impact the completeness and quality of care of patients in NPLCs. Identification of these factors will be valuable in the development of recommendations for improvements within the NPLCs.

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Chart Audit Tool

Patient and Organizational Items

Age in years
Sex 1= female, 2= male
Length of time at NPLC (in months)
Number of Chronic Conditions (including diabetes)
List of chronic conditions other than diabetes: (documented separately)
Number of telephone appointments in past 12 mos 1= yes, 0 = no
Number of appointments in past 12 months
Missed appointments in the past 12 months? 1= yes, 0 = no
Completion of dx testing in past 12 mos? 1= yes, 0 = no
Referral to specialists (in past 12 mos?) 1= yes, 0 = no
List of specialists referred to or seen (reported separately)
referral to diabetes education community programs 1= yes, 0 = no
EMR tracking of diabetes care (non-template?) 1= yes, 0 = no
Completion of EMR diabetes templates? 1= yes, 0 = no

Health care providers for frequency of appointments in past 12 months:

0=never, 1=once, 2= up to 3 times, 4= almost every visit (if more than 3 x but not every visit), 5 = every visit
primary NP
other NP
RN
RPN
MD visit
NPLC MD Consult
Other MD Consult
social worker
dietician
pharmacist consult
Other (list provider)

Diabetes Care Activities

A1C in past 3 mos? yes = 1, 0 = no
24hr urine or albumin to cr ration test in past 12 mos? yes = 1, 0 = no
lipid profile past 12 mos? Yes = 1, 0 = no
BP in past 12 mos? Yes=1, No =0
Retinal exam past 12 mos? Yes=1, No=0, unknown =2, patient refused = 3
complete foot exam past 12 mos? (visual inspection, monofilament, pulse) Yes = 1, No = 0
flu vaccine recommended past 12 mos? Yes= 1, no = 0
has ASA been reviewed/recommended? Yes= 1, No = 0
Smoking status assessed? Yes= 1, No=0

Chapter 7

7 Article #3: Multiple Case Analysis

Heale, R., James, S., & Garceau, M. L. (2016). A multiple case study in nurse practitioner-led clinics: An exploration of the quality of care for patients with multimorbidity. *Canadian Journal of Nursing Leadership*, 29(3), 37–45.

Note: This article has been edited after publication for the requirements of this PhD program and does not appear exactly as in the journal.

7.1 Article #3: Manuscript

A Multiple Case Study in Nurse Practitioner-Led Clinics: An Exploration of the Quality of Care for Patients with Multimorbidity

7.1.1 Abstract

The previous 16 years have seen a number of health care reforms meant to increase access to primary health care services in Ontario. This included the establishment of an innovative model, the Nurse Practitioner-Led Clinics (NPLCs). NPLCs held promise for NPs to practice to their full potential and optimize patient care. A multiple case study was undertaken to evaluate the quality of care for patients with diabetes and multimorbidity at NPLCs.

Five NPLCs, all in underserved areas in the mid-northern region of the province, were part of the study. Data collection included a chart audit, NP interviews and review of organizational information. Multiple case analysis was conducted and four, interrelated themes emerged about the quality of care of patients with diabetes and multimorbidity at the NPLCs.

It was confirmed that the NP is the primary care provider at NPLCs. Health care policy such as a lack of increase in NP salary for ten years has contributed to poor NP recruitment and retention. Insufficient health care resources in the communities where NPLCs are located and high patient vulnerability, has a negative influence on the quality of care. Strategies, including mentoring, offer possible solutions to improve the quality of care at NPLCs.

Key words: nurse practitioner-led clinics, primary health care, nurse practitioner, multiple case study, quality of care

7.1.2 Introduction

The new millennium brought a wave of primary care reform in Ontario (Sweetman & Buckley, 2014) with the overarching objective of increasing access to comprehensive primary health care

(Health Quality Ontario, 2015). One new model that arose from these reforms was the NPLC. NPLCs are unique in that they mark the first time that funding for provider-led comprehensive primary health care organizations was not based on physician remuneration. The NPLC model held the promise of innovation and allowing NPs to work in the full scope of practice (Virani, 2012).

The NPLC model is different from other primary health care organizations in that patients register to the NPLC and are assigned to a NP rather than rostered to a physician. NPs consult and collaborate with an interprofessional team of health care providers, including a mix of physicians, RNs, RPNs, social workers, dieticians and pharmacists (Virani, 2012). In this model, physicians act more as 'primary care consultants' and are funded to provide consultation for NPs on complex cases and, in a very limited context, to see these patients in the clinic setting (Virani, 2012).

Although the focus of this study is to research the NPLC model, it is important to provide detail about the value of NPs in PHC to provide a broader context. In one systematic review of 24 randomized controlled trials from a variety of countries findings showed higher patient satisfaction, a reduction in hospital admissions, and a reduction in mortality with NP-led compared to physician-led care (Martinez-Gonzalez, Djalali, Tandjung, et al., 2014a). A second systematic review of 41 international studies, which also included 31 RCTs shows that care provided by NPs versus physicians resulted in improved provision of patient information related to self management, higher levels of patient satisfaction and improved clinical outcomes (Tsiachristas,Wallenburg, Bond, et al., 2015). Four systematic reviews confirm that patient satisfaction rates are higher with NP care compared to physicians (Martinez-Gonzalez, Djalali, Tandjung, et al. 2014a ; Tsiachristas, Wallenburg, Bond, et al., 2015; Swan, Ferguson, Chang, et al., 2015; Martinez-Gonzalez, N. A., Tandjung, R., Djalali, S., et al., 2014b). Research across

the globe and in Canada shows that shows that health outcomes are as good, or better with NP care compared to physicians (Maier, Aiken & Busse, 2017; College of Registered Nurses of Nova Scotia, 2016)

NPs provided care consistently shows equivalent or better quality of care across a large range of clinical outcome measures, across a wide range of care settings and for a variety of patient groups (2, 3, 5).

Along with the primary health care reform there is an expectation of organizational accountability (MOHLTC, 2015). There has been extensive research of primary health care in Ontario, comparing various physician funding models and CHCs. Findings of these studies identify that CHCs offered significantly more comprehensive services and higher rates of health promotion than other models (Russell, Dahrouge, Tuna, Hogg, Geneau & Gebremichael, 2010; Hogg et al., 2009). Another study showed that patients at CHCs were from lower income, had higher rates on social assistance, more severe mental illness and chronic diseases than physician-based models of PHC, but also had considerably lower rates of emergency department visits than expected (Campbell, 2001; Glazier, Zagorski & Rayner, 2012). Another comparison of physician funded PHC models and CHCs demonstrated that overall the quality of diabetes care was higher in CHCs, while smoking cessation strategies and measuring waist circumference was higher in a blended-capitation model, and fee-for-service practices had the greatest gaps in care (Liddy, Singh, Hogg, Dahrouge & Talkjaard, 2011).

The NPLC model has not been part of research studies like other, well-established primary health care models. There are a number of national and international studies that evaluate and confirm the positive impact of NP practice. However, the studies focus on specific care settings

or conditions, such as in emergency room (Jennings, O'Reilly, Lee, Cameron, Free & Bailey, 2008) or in NP-led chronic disease management clinics (Watts et al., 2009) rather than models of care led by NPs. There is a gap in what is known about comprehensive primary health care models led by NPs, specifically the NPLCs, positioned within the Ontario health system context.

The purpose of this multiple case study was to evaluate the quality of care for patients with diabetes mellitus and multimorbidity in five NPLCs. Diabetes was chosen as a key element because it is one of the most complex conditions that is managed at the family practice level. The addition of patients with multiple chronic conditions allowed for a better understanding of the extent to which processes in the NPLC model supported care within best practice parameters in complex clinical situations.

7.1.2.1 Donabedian Quality Framework

The Donabedian Quality Framework offered a foundation for the study of NPLCs in this study. The definition of quality depends on the context of assessment. In this study quality was reflected in the diabetes care for patients with multimorbidity (Donabedian, 2003). Assessment of quality is achieved through the study of structure, process, and/or outcome (Donabedian, 2003). Structure refers to the conditions in which care is provided, or the way that health care is set up. This includes material and human resources as well as organizational characteristics (Donabedian, 2003). Process refers to the activities that constitute health care such as diagnosis, treatment, patient education and more. Process activities are carried out both by health care providers as well as patients and their families. Outcome is the desirable or undesirable changes that can be attributed to health care (Donabedian, 2003). In this multiple case study, the components of structure and process were utilized to evaluate the quality of care for patients with diabetes and multimorbidity at NPLCs.

7.1.2.2 Setting

The purpose of examination of several cases in a multiple case study is to recognize multiple realities, but also to seek assertions common to the whole (Stake, 2006). With this in mind, the NPLCs that were selected had different levels of organizational maturity, differing community resources and varying health care provider complements. The sample included five NPLCs, 2 located in urban and 2 in rural centres within the North East LHIN and one located in a rural setting in the North Simcoe Muskoka LHIN. These clinics all have similar issues related to unattached patients and limited health care resources (MOHLTC, 2010). Since the NPLCs included in the study all offered comprehensive primary health care and were from the mid-northern region of the province, the findings may not represent NPLCs that have a focused chronic disease approach or that are located in the far north or southern portions of the province.

7.1.2.3 Methodology

This study of the NPLC model was conducted using a multiple case study design derived from Stake (2006). In multiple case studies data are collected from several sources for each individual case. This study included three types of data collection: chart audits in each NPLC, NP interviews and a document analysis of policy and organizational features impacting NPLCs.

The outcome of the chart audit, NP interviews and NPLC document analysis of organizational information was a set of data about each individual case (NPLC) as well as analysis of each data set. For example, the chart audit conducted at the 5 NPLCs produced data for each individual NPLC, which could be analyzed both per case and as a whole to provide themes common across all the NPLCs.

The multiple case analysis started with the development of a description of each NPLC (Yin, 2014). Similarities and outliers about each NPLC in the study were identified and the characteristics of the individual NPLCs were explored related to the NPLC model as a whole. The findings for each NPLC case as well as the findings for data common to all the NPLC cases were examined (chart audit findings, documents related to the NPLCs and NP interview themes) and themes were derived from each source of data (Stake, 2006). The separate themes arising from each of the data sets (chart audits, NP interviews, document analysis of organizational documents) were compared and those common to all NPLC cases were extrapolated (Stake, 2006). Patterns among the common themes were identified and assertions were developed from the common themes, as they related to the research questions focused on the quality of care for patients with diabetes and multimorbidity at NPLCs (Stake, 2006).

Since assertions are not absolutes and can be disputed the assertions developed about the NPLC model were strengthened by triangulation of data, achieved by corroborating the consistency of findings using data from two or more sources (Yin, 2014). Further validation of the assertions was obtained through participant verification of the findings of the NP interviews, biostatistician consultation for chart audit analysis and reflexivity on the part of the researcher (Stake, 2006).

7.1.3 Findings

The analysis revealed that although there are some outliers in organizational structures such as the mix of interprofessional team members and the time and nature of physician collaboration, there were essentially no differences among the five NPLCs in the cross-case analysis, even taking into account the length of time the clinic has been in operation. Four interconnected themes and assertions emerged from this multiple case analysis.

Given the extensive volume of data it is not possible to provide detail about how the development of each theme. However, Table 7–1 provides some of the supporting data for each theme that helps to demonstrate how the themes arose from analysis of a variety of sources.

Table 7.1: Samples of Supporting Data for Themes

Theme 1. NP as Primary Care Provider
NP Interview: "So the people that are registered under my name, when they actually call in to be booked, the secretaries at the front do their best to book them in with the same nurse practitioner."(NP5)
Chart Audit: (n=150) 100(66.7%) patients had appointments with their primary NP more than once in the 12 months preceding the audit/40(26.7%) saw their primary NP almost every visit.
Theme 2. Nurse Practitioner Recruitment and Retention
NP Interview: "Provider turnover, maternity leave, definitely impacts how we provide care because we have to adapt…and we still have to function to provide primary care. "(NP4)
Organizational Data: 3 NPLCs had NP vacancies when chart audit was conducted. All had turnover and/or vacancies within the 2 years prior to the chart audit.
Theme 3. Health care Resources
NP Interview: "We don't have diagnostics here (in the community) so we offer lab services here at the office… For them to get an eye exam they have to go into (urban centre). If they need a diagnostic they have to go into (urban centre). If they don't have transportation or finances, then it becomes - let's see what we can kind of arrange. If you're 50 with diabetes and no access you're kind of out of luck. "(NP3)
Chart audit: number of patients who had attended a health program in their community, such as a diabetes education program. (n=150) 7 (4.7%)
Theme 4. Patient Vulnerability
NP Interview: "Basically client financial restraint is a big one (barrier to multimorbidity care) for us. A lot of them don't have access to transportation just cause we don't have a public bus system, or taxi service in the area so they either rely on family, friends, when they can. It impacts their ability to come to appointments or follow-up. A lot of them cannot afford their medication. It impacts what I can do as a provider or what I can recommend. Another barrier is lack of knowledge in regards to their chronic condition. A lot of them might have been diagnosed 10 years ago and I find that they still don't quite fully understand what diabetes can do to their system." (NP6)
Organizational Data: Complexity of patients was confirmed in other NP interviews, with staff at NPLCs and Virani (2012).

7.1.3.1 Nurse Practitioner as Primary Care Provider and Clinic Lead

This study confirmed that NPs are the primary care givers at NPLCs and that this role positively impacts the quality of care of patients with diabetes and multimorbidity. The NPs have their own case load, or panel, of patients for whom they have final responsibility. They utilize the expertise of the other members of the interprofessional team as required. Diabetes care processes are more complete when the patient sees their primary NP more often.

The NPLC organizational processes support NP practice and the role as primary provider and allow for increased access for patients with diabetes and multimorbidity. Patients are added to an NP's panel in the order that they 'sign up' for clinic services and only when the current patients registered in the clinic are stabilized. Patients are not restricted in the number of visits they can schedule with their NP and are able to address many problems per visit, which is in contrast to some physician-based practices where patients are only able to address one issue per visit (College of Physicians and Surgeons of Ontario, 2011). Each clinic has some form of 'same day' appointments and extended hours for at least one day per week to help increase availability of care. These features have contributed positively to the quality of care for patients with diabetes and multimorbidity at NPLCs and exemplifies the Ontario government's mandate for patients to receive quality care in a timely manner (MOHLTC, 2015).

Remuneration of health care providers at NPLCs has impacted NP practice. NPs are paid by salary. This has given the NPs the flexibility to address many problems per patient visit, conduct home visits and more. Other staff members at the NPLCs are paid by salary with the exception of physicians. Four NPLCs are funded $800/NP/month for physician consultation (Conference Board of Canada, 2012). The fifth NPLC had a physician salary line until 2014 and now receives the same physician remuneration as the other NPLCs. Physicians work as contractors and are

onsite at the five NPLCs on average one day per week. The result is that NPs in NPLCs have had to be extremely judicious with the cases that are taken to the physician for advice (Virani, 2012). The NPs have had to make clinical decisions at the full boundaries of their knowledge, skill and judgment and continue to expand their level of expertise. The NPLC model positions the NPs not only to be the primary care providers, but also to grow professionally related to the need to make complex clinical decisions with limited support.

Also unique to the NPLCs is the NP as clinical lead. This is in contrast to physician-led primary health care models as well as in many community health centres (Conference Board of Canada, 2012). In the role of clinic lead, NPs make decisions about policies and processes related to health care and clinical issues. This includes such things as orientation of NPs new to the organization and the distribution of physician collaboration time. The NP as clinic lead is a complementary role to the NP as primary care provider, since the NP is able to ensure that clinic operations support this model.

7.1.3.2 Nurse Practitioner Recruitment and Retention

Despite the positive influence of the NP as primary care provider, recruitment and retention of NPs is a major issue across all of the NPLCs. It was identified in the NP interviews and organizational data as having a negative effect on the quality of care of patients with diabetes and multimorbidity, largely because NPs left in the clinic were left to assume the care of a number of complex patients new to them. All the NPLCs in the study had experienced NP turnover and vacancies in the short period of time they had been in operation. Three of the NPLCs had NP vacancies during the time that the chart audit was conducted. When NPs left, their patients were shifted to remaining NPs who were not familiar with the patient files, thus increasing their

caseload. New intakes were put on hold. NP turnover and difficulties recruiting replacements has resulted in a slower intake of patients than had been anticipated and planned.

The issue is well documented by provincial organizations. NPs in primary health care settings have not had an increase in salary and no additional funding for benefits or pensions since 2006. Other organizations have NP salaries that are up to $25,000 higher than those in the primary health care sector as well as better benefits and pension packages. NPs are leaving PHC settings for more lucrative positions in these other organizations (Association of Family Health Teams of Ontario, 2013).

The individual NPLC cases have documented this issue, for example, in published annual reports, Quality Improvement Plans, documents and quarterly newsletters. Additionally, the NPLCs are often located in rural settings, up to an hour drive from major centres. There is no additional funding to offer incentives for travel to these rural settings, which further exacerbates the issue of NP recruitment and retention. NPLC administrators are creative in providing care for their patients through such things as contracting chiropractic services with unfilled NP salary funding. Telemedicine is used for very limited roles, such as consultation with a dermatologist. However helpful these additional services are, they do not replace access to a primary care provider.

When NPs leave NPLCs for other health care settings, they are most often replaced by less experienced, or newly graduated NPs. The result is less experience and less primary care expertise in the clinic environment. There is currently no mentoring or internship program for new NP graduates (DiCenso, Bryant-Lukosius, Bourgeault & Teloar, 2010). This adds stress on

the more experienced NPs who remain in the clinic. It also results in less access to service and, potentially, poorer quality of care.

As this article was being written, the government of Ontario announced an increase of $85 million over 3 years to support primary health care organizations, including NPLCs, in recruitment and retention of interprofessional staff (Tetley, Heydon & Agnew, 2016). This development has the potential to ensure the stability of NP staff at NPLCs. However, the extent to which the funding increase provides incentives to NPs to take positions at, and remain in NPLCs is yet to be seen.

7.1.3.3 Health Care Resources

The location of the NPLC impacts the quality of care for patients with diabetes and multimorbidity at the organization. Such things as health promotion programs and diagnostic clinics (e.g., to have blood work done) are not available in the smaller communities, or are not easily available to vulnerable patients without support to travel to, or attend these services. The result is that the NPLCs have used the funding available to them from health care provider salaries to train and schedule staff to do things such as draw blood. These are cost burdens that are not felt in the same way by other organizations that receive community development funds or are located in communities where these additional services exist.

In this study, attending a community program was significantly associated with better diabetes care. Issues of recruitment and retention of all health care professionals in the NPLCs has meant fewer resources to implement and maintain programs ‘in house’. The impact of lack of access to health care resources and community supports is additional cost and human resource burden on the NPLCs that consequently impacts the quality of care.

7.1.3.4 Patient Vulnerability

NPLCs do not interview and turn patients away if they do not meet the mandate or quota of the organization. Patients register from a waiting list based on the timing of their request to be part of the clinic (Virani, 2012). In addition, the NPLCs in the more rural areas are the only primary health care clinics within a wide geographical range. A large number of the patients taken into the NPLCs have not had primary health care for years and have numerous issues including diabetes and undiagnosed conditions. The result is that the NPLCs have many vulnerable patients who require more time and attention in order to address both complex medical and social issues. The complexity of this group has an impact on the quality of care of patients with diabetes and multimorbidity in the NPLCs.

7.1.4 Conclusions

This study outlined many issues related to structure and process in NPLCs that influence the quality of care, specifically for patients with complex clinical presentations related to diabetes and multimorbidity (Donabedian, 2003). Research arising from these findings could be directed at an exploration of factors related to the recruitment and retention of NPs as well as processes required for NPs to gain and expand clinical competence. NP education curricula should include the concept of the NP as primary provider, modeled by NP preceptors in clinical placements. Professional NP organizations and health care agencies should consider the development of mentorship to support novice NPs.

Health care organizations and government would be well served to recognize the unique experience of NPs in NPLCs and the organizational factors that facilitate or impede higher quality of care. Ongoing research of the impact of recently announced funding for primary health care organizations should be conducted to ensure that the objective of recruitment and retention

of experienced NPs in the NPLCs is achieved. Flexible funding, or other strategies that recognize the lack of community resources and patient vulnerability faced by NPs at NPLCs is paramount to improving the quality of care for chronically underserved populations in this model.

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Chapter 8

8 Discussion

This objective of this research was to evaluate the NPLC model through the appraisal of the quality of care of patients with diabetes and multimorbidity in NPLCs. The study shed light on how the organizational processes, health policy, NPLC patient and community characteristics impacted the delivery of care in NPLCs. Although targeted to the quality of care for a specific subset of the NPLC patients, insights about the NPLC model itself came to light. This study is valuable in that shows that patients receive quality care in the NPLCs. It also highlights the unique features in the NPLCs including NP as primary care provider as well as some of the pressures and inequities faced by NPLCs in the delivery of care. An understanding of these features may serve to inform positive health policy changes toward improvements in the NPLC model.

Donabedian's Quality Framework (Donabedian, 2003) served as a guide in the discussion of structure and processes of the NPLCs and their influence on quality of care. The Chronic Care Model provided identification of structure and process variables specific to the context of the NPLC including such things as community and clinical information systems (Group Health Research Institute, 2016). The components of health care structure in the Donabedian framework, and "Health Systems and Organization of Health Care" in the CCM also served as a guide for an examination of policies and processes impacting the NPLCs (Donabedian, 2003; Group Health Research Institute, 2016). However, the underlying beliefs and paradigms that impact the NPLCs have not been examined in depth. Historical viewpoints of the nurse and, by

extension the NP, the power of the physician role and hierarchy between NPs and physicians are important considerations in understanding current policies, such as the hold on NP remuneration for ten years. These will be reviewed in more depth further in this chapter.

The following three research questions were posed:

1. To what extent are clinical practice guideline indicators for diabetes care being met for patients with multimorbidity in NPLCs in the NE and NSM LHINs?
2. How do NPs at NPLCs in the NE and NSM LHINs evaluate the impact of the NPLC model on the quality of the care they provide to diabetic patients with multimorbidity?
3. What are the relationships between organizational characteristics in the NPLC model and the care of diabetic patients with multimorbidity?

The first question, which predominantly addressed clinic processes, was answered through a chart audit. Findings suggested that although there is evidence that care for patients with diabetes and multimorbidity in NPLCs was at a good level of completeness, some issues remain. For example, there were very few community referrals. This, along with less charting for diabetes care items that the patient had completed external to the clinic (e.g. eye exam, influenza immunization), suggest that there may be challenges with communication between the clinic and external organizations as well as a lack of community services.

These issues were detailed further with NP interviews, in answer to the second research question. Patient vulnerability related to lower educational levels and poor socioeconomic standing, was identified as a barrier to higher quality of care at the NPLCs. Communication amongst the clinic team members as well as with resources external the clinic was identified as a potential issue in the delivery of quality of care, as was high NP turnover and vacancies.

The final question, related to the relationship of organizational characteristics to the care of patients with diabetes and multimorbidity, was addressed through the multiple case analysis. This analysis first confirmed the homogeneity of the NPLC structures and processes and overall the study results demonstrated that both structural and process organizational issues affected the quality of care for patients with multiple chronic conditions in the NPLCs.

8.2 Limitations and Recommendations for Future Research

There are many limitations with case study research. Limitations in the collection and analysis of the chart audit, NP interviews and multiple NPLC cases have been reported in the individual articles in preceding chapters. However, there are two overarching challenges. The first is that the findings cannot be generalized to all NPLCs. Generalizability may be important if these findings are to be included in dialogue related to addressing gaps in the NPLC model. Yet, it's equally important that the needs of individual NPLCs are addressed. The gaps in resources for NPLCs in northern and rural areas are often different than those located in southern, urban centres. Mechanisms are needed for LHINs to address the unique, local circumstances of the NPLCs in each area. Consideration should also be given to strategies that can be implemented to mitigate any negative impacts of provincial or federal health policies on the NPLC model of care.

A second limitation to this NPLC case study research is that issues identified may become less relevant over time. For example, an increase in remuneration and changes to the regulation of NP practice, which occurred during this study, may have an impact on NP turnover rates and interprofessional relationships in NPLCs (Hay Group, 2012).

Future research should be targeted to overcome the limitations of this study and address issues that have been identified. With respect to the element of structure in Donabedian's Quality Framework, research related to the impact of NP remuneration on the NPLCs is an important consideration, particularly to determine if the increase in salaries has resulted in higher retention of NPs. In the process element, challenges with care of vulnerable patients should be undertaken. The CCM may also be used to guide future research, particularly related to issues of health equity. For example, to dig deeper into such things as the impact of lack of access community health resources on the health care in the NPLCs. Finally, research should also focus on the third element of Donabedian's Quality Framework, which is outcomes (Donabedian, 2003). In this case, the clinical outcomes of NPLC patients with diabetes and multimorbidity in NPLCs is warranted. These might include blood pressure and lab work results that are within the targets identified in the Canadian Diabetes Clinical Guidelines (CDA, 2013).

8.2.1 Critique of Donabedian Quality Framework

The Donabedian Quality of Care Framework, introduced over fifty years ago, has stood up over time. With its simplicity and flexibility, the framework remains a foundation in the evaluation of quality in health care (Sardasht, Shourab, Jafarnejad & Esmaily, 2014). It was the first model that stressed the need to review quality and the factors in health care delivery that influence patient outcomes. It was also the first model to identify the importance of such things as communication processes and use of clinical tools for evaluation, like charting (Ayanian & Markel, 2016). Another advantage of the Donabedian framework is that the elements of structure and processes allow for a detailed review of less obvious features such as the coordination of health care (Van Houdt, Heyrman, Vanhaecht, Sermeus & Lepeleire, 2013). The model includes all elements that influence health care delivery and outcomes, acknowledging that health care

does not happen in a vacuum (McDonald, Sundaram & Bravata, 2007). Despite the advantages, some elements of quality in the Donabedian framework, such as efficacy, are not easily measured (Ameh, Gomez-Olive, Kahn, Tollman & Klipstein-Grobusch, 2017).

Further reflection on Donabedian's Quality Framework demonstrated that it was appropriate and was a reasonable guide to research related to gaining a better understanding of the NPLC model. The Quality Framework is a natural fit for case study research (Donabedian, 2003) because the elements of Structure, Process and Outcome provide a context and boundary for a complex phenomenon of interest. In the case of NPLCs, a definition for structure related to NPLCs and processes was made feasible through the addition of the Chronic Care Model, the development of which arose from Donabedian's Quality Framework, which broke down health care organizational elements into smaller, measureable parts. For example, clinical information systems, an element of the CCM, was reflected in NPLC processes in the measurement of EMR tracking.

Although the Donabedian Quality Framework allowed for the definition and measurement of aspects of the NPLC model, it failed to provide a mechanism with which to explore the philosophical and cultural underpinnings related to the findings. In his textbook about the Quality Framework, Donabedian discusses contextual factors, which include culture, beliefs, values and assumptions (2003). However, within the Quality Framework, this is meant as:

> the prevailing set of beliefs and assumptions about how important quality is compared to other competing objectives, how quality is to be defined, who is responsible for it, and what methods of improving it are either acceptable or unacceptable to those who have the power to facilitate or hinder change (p 135).

The Donabedian Quality Framework helped to generate several themes in this multiple case analysis that provide more insight into the processes and structures within NPLCs. All datasets

(chart audit, NP interviews and documents), pointed to the NP as primary care provider and interprofessional team leader in the NPLCs. Both of these are unique in our health care system. However, the findings also suggested a relationship between external, structural forces such as health policy, societal values and beliefs that directly affected the care in the NPLC model. This is evidenced through the barriers to quality of care in NPLCs identified in the research related to policy. Policies continue to restrict NP practice, negatively influence the stability of human resources in NPLCs and fail to recognize both the social and economic inequities of patients in NPLCs, the balance of power in the health care system informing interprofessional practice and political decisions. These issues fall outside of the Donabedian Quality Framework and it is the point where it falls short in providing a framework for discussing and understanding the NPLC model from a broader context. A more comprehensive discussion about power and the influence on NP practice and, ultimately, NPLCs, deserves attention.

8.3 Power and NP as Primary Care Provider

Dusel (2006), in his thesis around political philosophy, speaks of power whereby a member of an institution such as a government or, in this case, also a physician group, utilizes their power with reference to themselves and not to the 'political community'. The result is corruption of that power. Corruption leads to self-serving decisions, often to the detriment of the larger population. This is not to say that the development of policies that negatively influence NPs and NPLCs is intentional, or even consciously driven. Rather, the lack of consideration of NP practice in policy development is complex and arises from the history of nursing and medicine as well as gender politics, the effects of which are hierarchy, power imbalance and inequities. Power will be examined with respect to dominant themes arising from this study namely NP as primary care provider and NP team leadership.

The view of NPs is influenced by the view of nursing and nurses. NPs often say 'we're nurses first' and all the documentation about the NP role and regulation highlight the nursing foundation, rather than the added controlled acts previously authorized solely to physicians (e.g., such as prescribing medication) (CNA, 2008). Failure of NP groups to separate from the idea of NPs as extensions of nursing has meant that NPs are not seen as unique practitioners and are subject to the historical views of nursing. The view of the NP as primary care provider in NPLCs is impacted by the view of nursing, as well as the view of medicine in our society.

8.4 Nursing as a Calling

NPs are incorporated in the worldview of nursing which has its modern roots in the 1800s. Florence Nightingale, while working to legitimize nursing through the establishment of formal nursing education and research, was deeply embedded in belief systems of the Victorian age. The view of women in society was integrated into the view of nursing, which she developed and promoted, in which she described nursing as a calling (Selandars, 2010a). "This would indicate that nursing should not be done merely for remuneration or because it is a popular a vocation. Indeed, the work of nursing is so important that it should be thought of as a religious vow." (Selandars, 2010b, p.83).

A modern view of nursing as a calling, including religious symbolism, persists. Raatikainen (1997) conducted a study to determine if there was a conflict between nursing as a calling and professional growth. She concluded that nurses who experienced a calling worked at a high professional level. Words used to describe nurses who had experienced a call to nursing were altruism, devotion, dedication, caring, being there, trust and loyalty. In addition, "…the nurses who had experienced a calling…seemed to act according to the principle of 'love one's neighbour' (p. 1115). In a more recent study, student nurses identified their belief that nursing is

a calling and were drawn to the image of a nurse as an 'angel in white.' (Rhodes, Morris & Lazenby, 2011).

It is important to understand that when the modern nursing profession was becoming established in the 1800s and early 1900's nursing as a religious calling was an important factor in empowering woman and achieving autonomy (Buresh & Gordon, 2000). It permitted women to transcend their father's authority, to travel and to work in a business model (e.g. to set up nursing programs or through hospital administration). Nurses were able to move beyond societal patriarchal authority. "Ironically, however, it is the angelic, saccharine, interpretation of religious nursing that lives on in popular stereotypes of the contemporary nurse" (Buresh & Gordon, 2000, p. 40). This, along with the view of women as caregiving, self-sacrificing and naturally nurturing, continues to undermine the view of women as knowledgeable and intelligent and, subsequently, impact society's view of nursing (Buresh & Gordon, 2000).

A calling, also identified as a vocation, is deemed to be the polar opposite of working for money (Nikkonen, 1992). Buresh and Gordon (2000) argue that the view of nursing as a vocation, or calling, has influenced the behaviour of nurses and the view of nursing, to their detriment. There is a strong culture of nursing where nurses do not communicate their value to health care. Subsequently, there is a lack of understanding of what nurses do and they are largely seen as dispensable, and are devalued by health administrators, physicians and even the general public. This impacts such things as policies toward fair and equitable remuneration as well as recruitment and retention strategies (Buresh & Gordon, 2000).

In a study conducted in the US, NPs described themselves as being marginalized. This was experienced through "being discounted in various ways, to various degrees" (Martin &

Hutchinson, 1997, p. 87). Discounting was psychological through being devalued, ignored and excluded as well as through structural conditions, which included lack of support for the NP role and inadequate resources for effective practice (Martin & Hutchinson, 1997). Discounting also included lack of appropriate financial reimbursement and ongoing legislative barriers to practice. The authors concluded that NPs must be recognized for their contribution to health care and valued in order to be recognized as primary care providers (Martin & Hutchinson, 1997).

This research demonstrates that NPs in NPLCs are in a similar situation to their US counterparts with respect to the lack of remuneration for a decade and ongoing regulatory practice barriers (Tetley, Heydon & Agnew 2016; CNO, 2018). This is also seen in funding disparities for NPLCs and physician-led PHC models (Haydt, 2014). Although NPs in NPLCs have taken the on the role of family practitioner, it is possible that deeply engrained beliefs about nurses, their role and value, continue to influence the ability of NPs and NP organizations in lobbying for adequate remuneration and clinic funding.

8.5 NPs and Gender Power Dynamics

Inequities in the funding structures for NPs and for NPLCs cannot be separated from gender power dynamics. Viewing the issue through a feminist lens may provide insight into the issues and strategies to evoke change. Nursing is an overwhelmingly female profession and as Chinn (1999) posits "...nursing as a social category has acquired gender traits that are associated with 'feminine', regardless of the sex of its individual members (p. 462)." The female perspective is not generally valued in society in comparison with the male perspective of science and medicine. The consequence is that '...moving to a place where the knowledge, actions and ideas of nurses can be valued is not an easy challenge (p. 462)." In fact, although NPs have always and continuously lobbied for health policy changes, this work is undermined by the fact that "nursing

care is often presented as an apolitical process which primarily focuses on patient needs and priorities" (O'Byrne, & Holmes, 2009, p. 153).

The conclusion of power focused feminist analysis of advanced practice nurses is that all women, to some extent, have less power, authority and autonomy than men. Women also have less political clout (Tong, 2015). The cause of women's oppression is found in the lingering social norms and formal laws that pose as barriers to women. For example, NPs in a female dominated profession are expected to be submissive and are viewed as complainers if they challenge the status quo (Tong, 2015). An example of the power inequities is that despite continuous and ongoing efforts by the NPAO to advocate for better remuneration for NPs, there were no changes to remuneration for more than a decade (Tetley, Heydon & Agnew, 2016) and that regulatory changes to remove barriers to NP practice are very slow to enact (CNO, 2018)

8.6 Medicine and NP as Primary Care Provider and Team Leader

Along with the evolution of the concept of the nurse and, subsequently, the NP, there was the development of the firmly established medical paradigm which has been the foundation not only of the beliefs physicians have about themselves, but also the beliefs that the general public, politicians and nursing included, hold about physicians and their place in health care (Turner, 2002). Foucault describes the development of medicine as a process where medical perception and knowledge evolved into an institution which "enclosed medical knowledge within a defined space" (Foucault, 2003, p. 28). He also describes the power and privilege that physicians experience that developed along with the establishment of the 'clinic' (Foucault, 2003). The clinic is where medicine dominates and power and knowledge are maintained in the care of patients and the families (Turner, 2002).

The concept of the 'family doctor' is entrenched in our culture, to the point that there is no other word for this role when completed by another health care provider. The result of this paradigm, along with power hierarchy in health care, is that there has been pushback from medicine against formal acknowledgement of the role of primary care from any other provider (Ontario Medical Association, 2009). Also nursing organizations do not fully understand the NP as primary care provider. The year that the NPLCs were introduced, the CNA issued a joint statement with the College of Family Physicians of Canada citing "Every Canadian should have access to a personal family physician and a registered nurse and/or nurse practitioner" (College of Family Physicians of Canada, 2007). While the statement strongly adheres to the support for interprofessional care and collaboration among physicians and NPs, it clearly continues to uphold the physician as primary care provider within the family practice setting. In addition, it adds further to confusion by appearing to present the role of the registered nurse and NP as equivalent and ignoring the expanded scope of practice of the NP.

The view of physicians in our culture influences not only the perception of the NP as a primary care provider, but also as an interprofessional team leader. Traditionally, there has been a hierarchy of power in health care where nurses, and by extension NPs, rank below physicians. All aspects of the relationship between nursing and medicine demonstrate this imbalance, right down to language used in both professions. For example, physicians give nurses 'orders' (Pijl-Zieber, 2013).

Physicians are deemed to be the natural leaders of PHC organizations (Conference Board of Canada, 2012). It has also been determined that "team effectiveness and collaboration can be compromised when team members perceive and/or project a professional hierarchical order of importance or power" (Conference Board of Canada, 2012, p 3). In order to mitigate poor team

dynamics, the role of the physician was clearly defined as primary care consultant in the development of the first NPLC (Virani, 2012). Yet, in this study the NP interviews confirmed tensions in the relationship of NPs and physicians, even within the NPLCs where NPs are considered to be clinical leaders.

In order to promote optimal team functioning in NPLCs, NP leaders must find ways to overcome challenges arising from the historical position of nurses. NPs may not realize that they have power and opportunity through the autonomy in designing their practices and the collaborative relationships (Burgess & Purkis, 2010). They need to assume the power inherent in this role and be more assertive regarding their skills and scope of practice as well as in defining the boundaries where there is overlap between professions both within and external to the NPLC organization (Archibald & Hutchinson, 2013). It is also important that there be organizational support for interprofessional teamwork in NPLCs in order to promote high interprofessional team functioning (Heale, Dickieson, Carter & Wenghofer, 2013). Finally, there is a need for additional research targeted to the operationalization of interprofessional teams in NPLCs.

8.7 Government and Policies

The provincial government has formally acknowledged the role of the NP as primary care provider through policy with the implementation of the NPLCs. Previous Minister of Health, in a Liberal majority government from 2008-2009, David Caplan, responded to a media campaign by physician groups with a letter to the Sudbury Star which confirmed the NP as primary care provider in NPLCs (Caplan, 2009). In addition, the provincial government has committed to improving access to a primary health care provider. The outcome of this is Health Care Connect, an organization that unattached patients can register with to help them find a doctor, or now also a nurse practitioner at an NPLC (Ontario, 2017).

However, incongruency exists between policy related to identification of the NP as primary care provider and policies affecting NP practice and NPLCs. There was a deafening silence for a decade at the government level to address NP remuneration. There has been little effort to ensure the full implementation of Bill 179 to remove regulatory barriers to practice. For example, elimination of the short list of ultrasounds and x-rays that the NP can order is being addressed in 2018, although Bill 179 was passed in 2009 (CNO, 2018). In addition, much of health care policy continues to be directed to physician and physician-led practices. In the case of the NPLCs Hadyt, (2014) suggests that policies have been made to support the FHTs, or physician-led models. FHTs have been more robustly funded so that the primary care provider remuneration (physicians) is well established, as is funding for targeted programs, linked to communities (Hadyt, 2014).

Provincial management of the NPLCs is another concern. The MOHLTC, through the Primary Care Branch, currently oversees NPLCs, FHTs and physician funding. However, the intention is to transfer the management responsibility of NPLCs to the LHINs, which now manage CHCs and Aboriginal Health Access Centres (Auditor General of Ontario, 2016). Although the Primary Care Branch supports the NP as primary care provider, there has been a lack of understanding of the issues unique to NPLCs that impact the quality of care in these models. With movement of management to the LHINs, the concern is that there will be even less general knowledge about the NPLC model resulting in additional issues. Proactive strategies to educate and inform LHIN executives about NPs and NPLC model are warranted.

8.8 Taking Action

Despite the overall good quality of care at NPLCs for patients with complex multiple problems, it is clear that the link between quality of care in NPLCs and such things as stability of NP

workforce in this model of care, or community resources of NPLCs is not formally recognized. Much of health care policy continues to be directed to physician and physician-led practices. This study and others suggest that policies better support physician-led models (Hadyt, 2014). Regulation and adequate remuneration for NPs is slow to change and has required continuous lobby of the MOHLTC from NPs and NPAO (NPAO, n.d.). NPs experience a lack of support and incongruence between role expectations and realities of the health care system as well as a sense of power inequity with health policy leaders (Burgess & Purkis, 2010). Findings of this study demonstrate this through structural and process issues, including NP turnover and NPLCs NP remuneration, issues in interprofessional team functioning, barriers to NP practice and lack of resources linking patients, especially those who are vulnerable, to community resources.

NPs are challenged to continue to have a voice for health policy changes, which includes studies such as this one, for NP practice and models of care (Fawcett & Russell, 2002). The difficulty for any group working to change health policy directed to NPLCs is to address the underlying values and beliefs of the policy makers at the government level as well as the with health care providers and communities, to move people toward a different understanding of the role of the NP and, subsequently, the NPLC model of primary health care (Greipp, 2002). NPs in NPLCs will need to strive to overcome the historical perception of their practice as nurses and to find ways to augment their power.

Although there are challenges, NPs in NPLCs are in a unique position because of their level of autonomy and scope of practice to address inequities in policy and practice and enhance the quality of care (Archibald & Fraser, 2013). Lobbying of professional organizations is essential in any campaign to address health policy. However, the successes of the NPAO have been slow, which speaks to the need for enhanced advocacy of individuals. To start, NPs in NPLCs are

encouraged to adopt a broader perspective on health care that encompasses an increased awareness of the complex interplay between social determinants of health, health policy and delivery of health care (Archibald & Fraser, 2013).

NPs need to acquire 'symbolic space' which will be achieved once they become part of the provincial consciousness and powerful brokers in health care recognize their professional identity and value their contribution and acceptance as primary care providers and clinic leaders. (Martin & Hutchinson, 1997). Achieving symbolic space will require NPs to recognize and accept that there is a political side to NP role development which requires strategic leadership to navigate the complexities (Burgess & Purkis, 2010). Individually, they need to gain skills in communicating their value and that of NPLCs through speaking to journalists, health policy makers, patients, families and communities and with NP organizations advocating on behalf of NPs (Buresh and Gordon, 2000). A key area to address is NP remuneration. A sound funding mechanism is a critical issue to ensure a sustainable NP workforce in the NPLCs (Burgess & Purkis, 2010).

Collaboration is central to NP role integration and it facilitates NP autonomy and power (Burgess and Purkis, 2010). Advancing role autonomy for NPs, in the case of the primary care role at NPLCs, requires the NPs to foster effective collaborative relations internal and external to the NPLCs. However, success will not come in isolation and appropriate health policy changes are required (Burgess and Purkis, 2010). To make these changes, NPs need to form strategic alliances with health policy makers to mitigate policy issues impacting quality of care at NPLCs (Burgess and Purviss, 2010).

Along with individual activities, mobilization of a collective group continues to be essential. Cranmer (2002) indicated that "organizational affiliation has consistently been shown to have a positive effect on nurses' (NP's) level of political activity…" (p. 98). The Nurse Practitioners' Association of Ontario is a strong advocate for fair and equitable NP remuneration, the enactment of all outstanding regulation related to NP practice and to promote the development of additional NPLCs in underserved areas of the province (NPAO, n.d.). There has yet to be a campaign specific to the gaps in resources in NPLCs and inequities between this model and others in the province. A formal NPLC mandate is required.

8.9 Conclusions

This dissertation began with the assertion that a strong PHC sector is important in ensuring overall health through access to health care services and good quality care (Working Group on Primary Care, 2011). The NPLC model was developed in response to a lack of access to PHC in Ontario. Having met the first criterion, research related to the quality of care in NPLCs was warranted. The value of the NPLC model in the delivery of comprehensive PHC services is supported in this research. However, the strength of the NPLC model within the PHC sector is challenged. The role of the NP as primary care provider and clinic leader needs to be reinforced through policy and a formidable shift in the current view of health care in Canada. The ongoing success and expansion of the NPLC model will only be achieved if the role of the NP is fully understood, valued and supported.

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APPROVAL FOR CONDUCTING RESEARCH INVOLVING HUMAN SUBJECTS

Research Ethics Board – Laurentian University

This letter confirms that the research project identified below has successfully passed the ethics review by the Laurentian University Research Ethics Board (REB). Your ethics approval date, other milestone dates, and any special conditions for your project are indicated below.

TYPE OF APPROVAL / New / Modifications to project X / Time extension X	
Name of Principal Investigator and school/department	Roberta Heale, Nursing
Title of project	Evaluating the Quality of Multimorbidity Care at Nurse Practitioner-Led Clinics in the Northeast LHIN
REB file number	2014-01-08
Date of original approval of project	Feb 10, 2014
Date of approval of project modifications or extension *(if applicable)*	April 10, 2015
Final/Interim report due on: *(You may request an extension)*	April 2016
Conditions placed on project	

During the course of your research, no deviations from, or changes to, the protocol, recruitment or consent forms may be initiated without prior written approval from the REB. If you wish to modify your research project, please refer to the Research Ethics website to complete the appropriate REB form.

All projects must submit a report to REB at least once per year. If involvement with human participants continues for longer than one year (e.g., you have not completed the objectives of the study and have not yet terminated contact with the participants, except for feedback of final results to participants), you must request an extension using the appropriate LU REB form. In all cases, please ensure that your research complies with Tri-Council Policy Statement (TCPS). Also please quote your REB file number on all future correspondence with the REB office.

Congratulations and best wishes in conducting your research.

Rosanna Langer

Rosanna Langer, PhD, Chair, Laurentian University Research Ethics Board